100+Biodiversity Positive Practices and Actions Around the World

China Environmental Protection Foundation
Paradise International Foundation
Shan Shui Conservation Center
Global Environmental Institute

China Environment Publishing Group

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Preface

The 2050 vision of the Convention on Biological Diversity (CBD), "living in harmony with nature", is not only the core of biodiversity conservation and ecological civilization, but also in line with the concept of "a community with shared future".

In the last few decades biodiversity has declined rapidly over the world. World Wildlife Fund (WWF)'s "Living Planet Report 2020" warned that from 1970 to 2016, the populations of mammals, birds, amphibians, reptiles and fish monitored had globally shrunk by an average of 68%. Among freshwater species, this figure is thought to have reached 84%. The report also pointed out that the global biodiversity integrity index (BII) has plummeted to 79%, far lower than the proposed lower safe limit of 90%, and it is continuing to fall. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)'s survey shows that the major direct drivers of global ecosystem decline include changes in land and sea use, and the direct consumption of natural resources, together accounting for more than 50% of the decline.

Reversing the downward trend of biodiversity is the common goal of humanity which, given its commonality and urgency, necessitates society-wide participation in conservation. Non-state entities including social organizations work on the ground to provide innovative and diverse solutions that make a difference. They have devised and implemented new ideas and methods of biodiversity conservation, in addition to providing a way for the general public to participate in and support these activities.

This is the context in which China Environmental Protection Foundation (CEPF) and Paradise International Foundation, under the guidance of the CBD Secretariat and the Office of the Executive Committee of the Preparatory Work for the fifteenth meeting of the Conference of the Parties (COP15), launched "100+ Biodiversity Positive Practices and Actions Around the World" campaign to showcase the

determination and effectiveness of non-state entities around the globe in delivering diverse and successful examples of biodiversity conservation. of the 258 submissions from 196 applicants in 26 countries and seven continents, 108 have been selected as "Noteworthy Practices" for this publication. The majority of those selected cases (about 80%) are from China, with the remainder from more than 20 other countries, territories and cross-regional collaborations. The selected case studies are presented here in ten categories, according to conservation approach.

Half of these case studies demonstrate various approaches to in-situ conservation, including conservation actions for species (mammals, amphibians, avifauna, aquatic creatures, plants and others) and ecosystems (forests, grasslands, mountains, arid and semi-arid areas, wetlands, oceans, coastal, urban areas and so on); the other half includes measures such as legal approaches, public participation, publicity, advocacy and education, policy-making and implementation, financial support mechanisms, technological innovation, sustainable use, benefit sharing of genetic resources, and traditional knowledge. Of the entire 258 actors, 50% are social organizations, 20% are corporate entities, 20% are government agencies, institutions, and schools, and 10% are rural, urban communities and individuals. This mix reflects the diversity of contributions by multiple actors engaged in biodiversity conservation.

In line with the structure of the "Post-2020 Global Biodiversity Framework" due to be agreed at COP15 in 2022, this publication consists of three parts: ①reducing threats to biodiversity; ②addressing people's needs through sustainable use and benefit sharing; ③implementing tools and solutions for mainstreaming.

Specifically, in terms of reducing threats to biodiversity, national-level spatial planning, such as the "Ecological Conservation Redline (ECR)" of China, comes into play to enhance ecosystem integrity and ensure the incorporation of key biodiversity areas in a comprehensive spatial program. We showcase wildlife corridors being conserved by Save the Elephant, to alleviate human-elephant conflicts in Africa, protected habitats established for primates in Vietnam, and the efforts to restore the ecology of Yellow Sea coastal wetlands at a new World Heritage Site in Yancheng, China.

Community-based conservation and alternative livelihoods help to meet people's needs through sustainable use and benefit sharing. Several urban community projects selected in this publication, such as Peking University's Yanyuan Nature Reserve and Leyi Habitat Garden, provide inspiration for biodiversity conservation and utilization in

densely populated areas. Local communities in Guanba Village, Pingwu County, part of the Giant Panda National Park, have directly benefited from beekeeping and nature education while preserving local ecologically sustainable traditions. In the Philippines, Coast 4C Limited works to promote community-based marine protected areas and regenerative seaweed farms to increase local incomes, while driving the restoration of habitats for coral reefs and other marine species.

Friends of Nature's actions to protect green peacock (*Pavo muticus*) habitat in China, a case of protecting the Amazon rainforest in Brazil, and a case of illegal trade of protected bird species in Belgium highlight the important role of legal approaches in conservation. In New South Wales, Australia, a "Saving our Species" program me has been launched by the Department of Planning, Industry and Environment to promote statewide conservation actions at the policy level with a large-scale database of species information, spatial modeling assessment and financial support. In addition, conservation can become more visual and intelligent with technological solutions at play, such as the Biodiversity Lab from the United Nations Development Programme (UNDP), "AI for Earth" from Microsoft (China) Co., Ltd. and "Tencent for the Planet" from Shenzhen Tencent Computer System Co., Ltd.

Also included in this publication are many innovative approaches. The Community of Arran Seabed Trust in Scotland protects seabed habitats through research and citizen science, including an expanding marine "no-take" zone. The Ant Forest project, founded by Ant Group, offers the public a visual representation of wildlife and frontline conservation workers in distant protected areas via a mobile app that is designed with a user point-reward system for green lifestyles and mechanisms that include having a tree planted in the desert or claiming 1 m^2 of a protected area (PA). From 2016 to 2021, 326 million trees had been planted and over 100 million people engaged in PA-based conservation under this project. Another example shows how Hainan gibbons are being protected, with rope bridges used to connect the fragmented habitat based, as well as efforts to cultivate the native tree species on which they like to feed. Such work has led to a steady rise of the gibbon population in Hainan between 2013 and 2021.

However, compared with the huge amount of work needed to protect our biodiversity, the levels of social organization and public engagement, private funding, and international exchanges and cooperation remain insufficient, leaving much room for improvement, specifically in the following areas:

For social organizations, more attention is needed on marine ecology and the

conservation of relatively neglected groups of species such as insects. Today, the majority of efforts highlighted in this publication are focused on terrestrial ecosystem conservation. Aquatic creatures, insects and other key groups of species require more research and conservation actions.

In addition, conservation approaches such as legal actions, genetic resource benefit sharing, traditional knowledge, and technological innovation need to be better understood and practiced.

We have seen the importance role and value of the private sector supporting social organizations in biodiversity conservation. For example, Huatai Securities launched the "One Yangtze River" project, providing long-term financial support for social organizations to undertake innovative practices along the Yangtze River in China. However, it should be noted that financial input from the private sector remains limited. As private funding can help to promote innovation, it is necessary to encourage more industries to work with social organizations and other actors to establish long-term financing mechanisms to promote more conservation actions. Enhanced cooperation is needed among social organizations, business, and government agencies to build more synergies between practice, research, and financial support for biodiversity conservation.

Finally, from these case studies, we see inspiring actions that are tailored to local conditions all over the world. It is clear that more international exchanges and collaborations are needed to achieve the goals of the post-2020 Global Biodiversity Framework. These interactions are of vital importance; by sharing experience and technologies, we can help each other, deepen our understanding, explore new pathways of conservation, break down our own barriers, and better promote innovative conservation practices and experiences.

This anthology of case studies reflects the long-term, determined efforts of non-state entities in biodiversity conservation worldwide. The next ten years will be crucial to reverse the declining trend of biodiversity in order to manage the tremendous risks to humans. We expect the conservation experience and paradigms collected herein will inspire and drive more conservation actions, help the mainstreaming of biodiversity and lead us into a better future where humans and nature coexist in harmony.

We would like to give special thanks to the CBD Secretariat and the Office of the Executive Committee of the Preparatory Work for the COP15; We are grateful to the

Ministry of Ecology and Environment, particularly its Department of Nature and Ecology Conservation, Department of International Cooperation, and Department of Communications and Education, for their guidance on this work. For their support, we are indebted to all the Yangtze River Fisheries Administration of the Ministry of Agriculture and Rural Affairs, the Department of Land Spatial Ecological Restoration of the Ministry of Natural Resources, the Chinese Arctic and Antarctic Administration, IUCN, China Environment News Agency, the Chinese Academy of Forestry, the National Resource Center for Chinese Materia Medica, China Academy of Chinese Medical Sciences, Conservation International, ClientEarth, the Global Environment Facility (GEF) Small Grants Program (SGP), Beijing Weimeng Chuangke Network Technology Co., Ltd., and Global Environmental Institute (GEI).

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The case studies included in the book, including all text materials and photos, are provided by the applicants of "100+ Biodiversity Positive Practices and Actions Around the World" campaign. The applicant entities are responsible for the authenticity, originality, accuracy and legality of the case studies and corresponding contents, and shall bear relevant responsibilities. Please contact the corresponding applicant entity if you find the case study (including but not limited to text and photos) infringing the legitimate rights and interests of others, or if you plan to file claim.

We apologize for any omissions or inadequacies you may find in this publication as a result of our limited time and expertise. Your insights are deeply appreciated.

April 22nd, 2022

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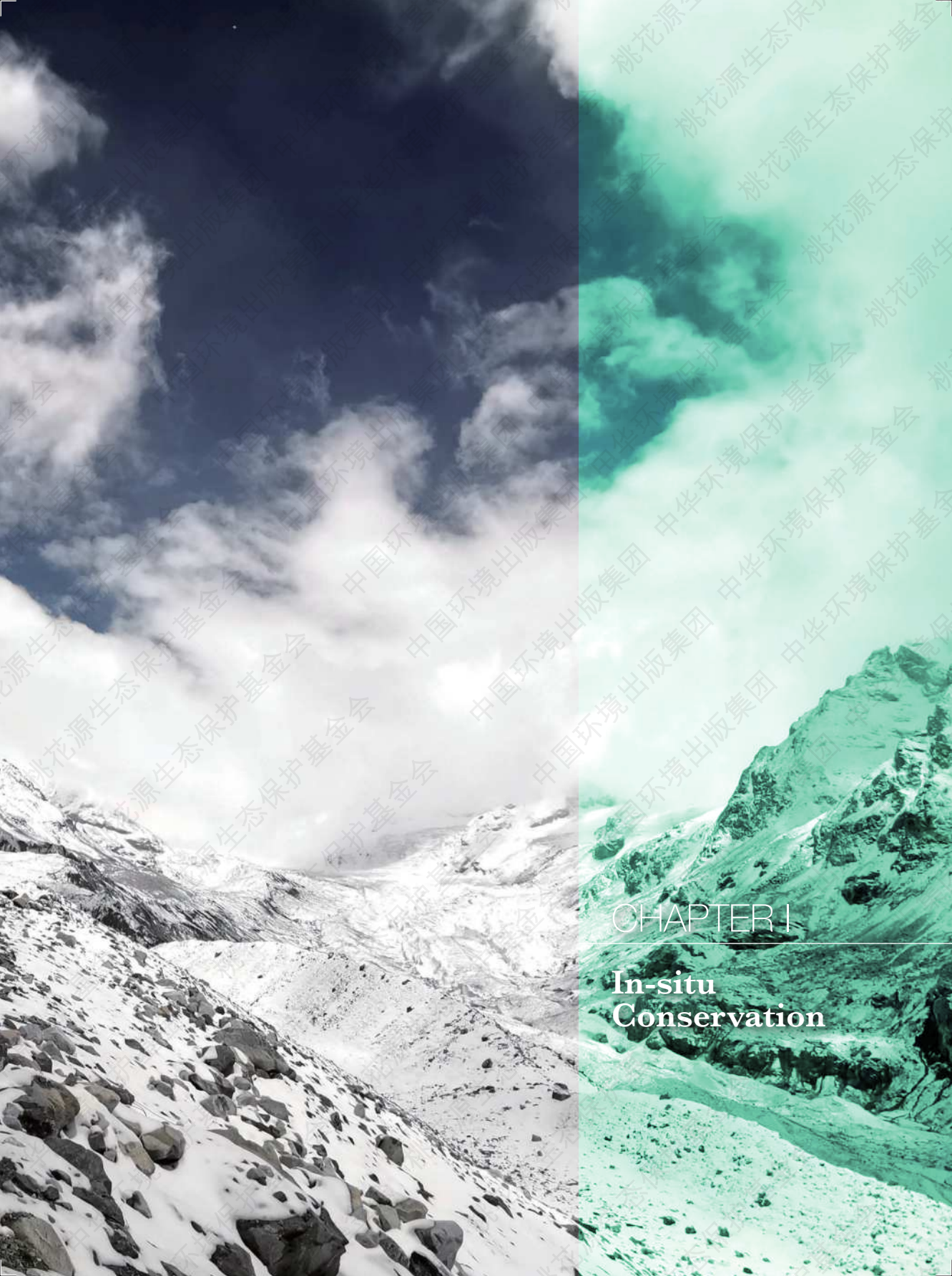


CHAPTER I

In-situ Conservation

01

Living with Tigers and Leopards

China Green Foundation

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Sustainable use of biodiversity

Targets: Forest; Mammals; Genetic diversity

Location: Northeast China Tiger and Leopard National Park

Year of Implementation: 2018

Background

Both the Siberian tiger (*Panthera tigris altaica*) and the Siberian leopard(*Panthera pardus orientalis*) are listed as the Endangered (EN) and Critically Endangered (CR) species in the *IUCN Red List of of Threatened Species* (IUCN① Red List for short) respectively. They are rare animals in China with global significance. At the top of the food chain, they are flagship species for biodiversity conservation, and their existence is a sign of the health of temperate forest ecosystems. During the construction of the Northeast China Tiger and Leopard National Park pilots, the breeding populations of tigers and leopards were continuously recorded, including more than 12 newly born Siberian tiger cubs and more than 11 Siberian leopard cubs.

Zhen'anling Village is located in Hunchun City, the easternmost part of Yanbian Chaoxian (Korean) Nationality Autonomous Prefecture, Jilin Province. The surrounding area of the village is the core area of the Northeast China Tiger and Leopard National Park.The construction of the Northeast China Tiger and Leopard National Park and contributes to a rapid growth of wild animals, and attracts the tiger and leopard families began to settle in the forest around Zhen'anling Village. The villagers of Zhen'anling Village live the nearest to them, which has also brought unprecedented changes to the daily life and production of the Zhen'anling villagers. Herbivores such as sika deer(*Cervus nippon*) and wild boars(*Sus scrofa*) in the forests around the village enter the farmland more frequently to

① International Union for Conservation of Nature.

Infrared camera trap monitoring image of the Siberian tiger

feed on crops, causing harvest losses to villagers. At the same time, the villagers' traditional means of production, such as gazing and picking in the forest, have been banned. Therefore, the income of many villagers has been severely affected, which caused the resistance of villagers to the protection of tigers and leopards.

Main activities

The frequent appearance of wild animals has caused conflicts and challenges in Zhen'anling Village, but it has also brought unprecedented opportunities to the transfer he ways of production and life. How to turn regional ecological advantages into the practical ecological industry? Villagers urgently need the answer and support. To this end, in 2018, the China Green Foundation launched the "Walk with Tigers and Leopards" project, and dedicated to building an eco-friendly rural community with harmony between humanity and nature.

This project takes Zhen'anling Village as a pilot and adopts comprehensive measures to promote the sustainable livelihood of villagers in the local community and promote the safe and healthy development of wild Siberian tiger and leopard populations.

①Build ecological farmlands，and introduce a compensation mechanism. This project aims at compensating for the losses caused by ecological conservation, and revolving conflicts between humans and wild animals . The villagers worked hard throughout the year, but they were unable to increase production and income, because most of the farmland in the village became a natural "canteen" for wild animals. This project purchased the food crops trampled by wild animals in a way of

A patrolman is clearing the animal traps (left)
Surveying the footprints of tigers and leopards (right)

estimating output, subsidized the economic losses suffered by the villagers from protecting tigers and leopards, in order to change the villagers from “animal chasers” to “animal keepers”. After that, it helped the villagers change their minds and change their ways of production and life to develop green and characteristic agriculture such as bee breeding, so as to make them obtain increasing their sustainable income in a sustainable way.

②Establish a villagers-based ecological patrol team, carry out professional training, and improve villagers’ ecological service skills. The captain of the patrol team, had been working outside for many years. He learned that the China Green Foundation was going to set up a patrol team in his village, which was guided by a professional scientific research guidance, so he immediately signed up and returned to the hometown. Under his leadership, a patrol team composed of local people was soon established with the help of the China Green Foundation. The patrol team is responsible for removing animal traps in the mountains and forests, and promoting the realization of “zero poachings” within the village, thus protecting the safety of the local tiger and leopard populations, and providing a safe habitat for the tigers, leopards and other wild animals. Another important task of the patrol teams to collect animal feces scientifically and submit them to the scientific research team to assist in the analysis of the feeding habits and heredity of the Siberian tiger and the Siberian leopard. According to statistics, as of September 2021, the patrol team has patrolled more than 10,000 km, cleared more than 50 animal traps, cooperated with the scientific research team to install more than 40 sets of scientific research equipment, conducted surveys on 20 sample plots, and collected more than 600 scientific samples such as animal feces.

③Support community development and help villagers establish camps for eco-tourism and nature education relying on natural advantages. By supporting community development, villagers’ living conditions have been improved and villagers’ sense of pride and responsibility have been boosted. By changing ways of production and life,the Hubao(tigers and leopards) Village can to create a beautiful and happy life themselves,which contributes to the steady development of the local economy and society.

Through the coordinated development of the three activities, an eco-friendly rural community will be built with humans and nature coexisting in harmony.

Main outcomes

(1) Ecological value

Through the implementation of this project, a safe habitat for tigers, leopards and other wild animals

will be established, the population of herbivores and the quality of the food chain will be improved, and the restoration of the ecosystem and the protection of biodiversity will be effectively promoted. This project covers the settlement area of 300 km^2, which a settled female tiger usually needs as a good habitat. The project aims at having a settled female tiger family(about 5% of China's current settled female tigers) settled down, and conserving the ecosystem on which it depends.

(2) Social-economic value

This project integrates ecological protection and national park community construction as a whole. Through a series of measures such as scientific research and monitoring, patrol teams building, planting of ecological farmlands, substitute livelihood, and community-wide nature education, it provides local residents with work opportunities of multi forms.

Since the implementation of this project, the diversity of local species has been continuously improved, and the wildlife videos recorded by infrared cameras have also attracted the attention from many enthusiastic public interest enterprises and the public. Furthermore, media interviews, new media advertising, online activities, platform cooperation, and project site visits have attracted more than 200,000 people. Monthly donators and one-time donators have exceeded 130,000.

(3) Innovation

Ecological protection and conflicts between humans and animals are common issues in the construction of national parks. This project is designed according to local conditions. By mobilizing local villagers to form a tiger and leopard patrol team, and practical actions such a "clean mountain, no snares" to transform villagers' perspectives from not harming wildlife to protecting them. Through the construction of ecological fields, project meets foraging needs of herbivorous animals such as wild boars and sika deer and established a complete biological chain form the bottom up. By supporting local villagers to find alternative livelihoods such as beekeeping and crop planting, project gradually establishes a community building path where people and tigers live in harmony. The project continuously innovates the mode of publish participation, and continuously improves its social influence through public reading, social practice of college students, NGO co-construction, etc., and guides the public to gradually raise awareness of biodiversity conservation, inspires the public to become supporters, participants and promoters of tiger and leopard conservation.

About the applicant: Founded in 1985, China Green Foundation is a national public-raising foundation directed by the National Forestry and Grassland Administration. In 2002, it was granted special consultative status by the UN Economic and Social Council. It shall enjoy the preferential policies of enterprise income taxpayer donating to the China Green Foundation as stipulated by the State Taxation Administration.

02

Promoting the Restoration of Siberian Tiger (Amur Tiger) Population in China

Wildlife Conservation Society(US), Beijing Representative Office

Approach: In-situ conservation

Targets: Mammals

Location: Hunchun Siberian Tiger National Nature Reserve, Northeast China Tiger and Leopard National Park, China

Year of Implementation: 2008

Background

The Siberian tiger is one of the flagship species of forest ecosystem restoration in northeast China and one of the most critically endangered big cats in the world. national first-level protected animal in North China and was once widely distributed in the north of China. From the end of the 19th century to the middle of the 20th century, the distribution range and population of the Siberian tiger gradually decreased and the distribution area kept shrinking to the east and north areas and became increasingly fragmented. Two large-scale surveys of the Siberian tiger population in 1998 and 1999 showed that there were 7~9 Siberian tigers in Changbai Mountain, Jilin Province.

Rampant Poaching, prey scarcity, “human-tiger conflict”(HTC), and habitat fragmentation are still the main threats to the restoration of the Siberian tiger population nowadays. In order to promote the restoration of the Siberian tiger population in China, Wildlife Conservation Society(WCS) has been engaged in the protection, research, and education campaign of the Siberian tiger for a long time since the late 1990s.

Main activities

①In 2001, WCS cooperated with the local conservation department to promote the establishment of Hunchun National Nature Reserve with the Siberian tiger as the object of protection.

In May 2021, WCS, the Natural Resources Defense Council (NRDC) and Northeast China Tiger and Leopard National Park jointly promoted the establishment of the first community co-management patrol team in the park

②On the one hand, opportunistic monitoring and systematic infrared camera monitoring were carried out to understand the population structure and quantity changes of the Siberian tiger. On the other hand, WCS cooperated with local conservation department to carry out patrol and trap clearance, and took the lead in introducing foreign advanced Self-Monitoring, Analysis and Reporting Technology(SMART) patrol management system to fundamentally eliminate the threats to the survival of the Siberian tiger in the habitat, including the direct threat of hunting traps and the prey shortage caused by poaching.

③Since 2008, with the upgrade of SMART system, WCS has been providing technical training and application guidance to users and continually strengthening anti-poaching law enforcement and wildlife resource monitoring continually. In order to resolve the human-tiger conflicts, WCS organized

A photograph of a Siberian tiger family in 2018, one female tiger with two cubs

twice training courses on HTC in 2017 and 2020 respectively to train conflict emergency response teams, and at the same time, carried out publicity and education on HTC in the community to strengthen villagers' awareness of wildlife protection and self-protection.

④WCS actively encourages the community to participate in protection, and innovates a model of the anti-poaching campaign, the community co-management. In May 2021, WCS helped build the first community co-management patrol team in Northeast China Tiger and Leopard National Park. By means of community co-management, the relevant local government department can establish a wildlife conservation patrol system together the local residents.

At present, with the improvement of habitat quality, the restoration of prey population, and the effective control and prevention of HTC, the population of the Siberian tigers is increasing. Since 2013, WCS has detected 45 Siberian tigers in Hunchun National Nature Reserve, including six tiger families, with the largest one containing four cubs. The Siberian tigers no longer roam around the China-Russia border but have made their home in China.

Main outcomes

(1) Ecological value

As a large carnivore, the Siberian tiger plays an indispensable role in maintaining the natural food chain, protecting species diversity, and maintaining ecological balance. The loss of a wild species can affect the survival of many species, even the entire food chain, ecosystems, and biodiversity. The survival of the wild population of the Siberian tiger requires a considerable area of forest vegetation, a certain amount of prey population, and a preferable social surroundings. Therefore, the protection of the Siberian tiger also protects a large chunk of forest and a large number of wild animals and plants, protects the biodiversity of habitat, and maintains the ecological balance.

(2) Social-economic value

This project has promoted the development of regional economy to a certain extent. As an important wildlife resource, the Siberian tiger is not only of great ornamental, aesthetic and cultural value, but also is an animal concerned by the global community. The Siberian tigers are conducive to improving local popularity, promoting extensive international exchanges and cooperation, and developing regional brand economy and tourism with the popularity of the Siberian tiger.

(3) Innovation

Hunting tools for ungulates have been a great threat to the survival of the Siberian tiger. To combat illegal poaching and protect Siberian tigers and their prey, WCS took the lead in introducing the foreign advanced SMART patrol system into China; The system includes some advanced computer technologies such as geographic information system(GIS), global positioning system(GPS) and statistical analysis, and plays an important role in anti-poaching.

About the applicant: Founded in 1895 and is headquartered in New York, USA, the Wildlife Conservation Society (WCS) is one of the oldest and most successful nature conservation organizations in the world.In September 2017, the “Wildlife Conservation Society(US), Beijing Representative Office” was officially registered with its authority under the National Forestry and Grassland Administration. At present, WCS focuses on the protection and capacity building of snow leopards in the Sanjiangyuan region as well as the research on HTC in western China, promotes the transnational protection of the Siberian tigers in Northeast China, participates in the research and protection of Chinese alligators for a long time in the middle and lower reaches of the Yangtze River, and carries out a work aiming at reducing the illegal consumption and trade of wildlife in South China.

03

Averting Primate Extinctions in Northern Vietnam

Fauna and Flora International Vietnam Programme

Approach: In-situ conservation; Public participation; Technological innovation;Sustainable Use; Access and benefit-sharing of genetic resources; Traditional knowledge

Targets: Forest; Mountain; Mammals

Location: Northern highlands limestone region, Vietnam

Year of Implementation: 1998

Background

Vietnam is a global primate hotspot, with 25 species in a relatively small country. In 1998, Fauna and Flora International(FFI) established a program of work in Vietnam, especially focusing on the northern highland's limestone region. Initial interventions at the turn of the millennium focused on surveying the northern Vietnam provinces for globally endangered primates. In 1999, this led to the rediscovery of populations of the western black crested gibbon(*Nomascus concolor*), the only known populations in Vietnam. Further primate surveys in 2002 and 2003 led to the discovery of a new population of Tonkin snub-nosed monkeys(*Rhinopithecus avunculus*) and the rediscovery of the eastern black crested gibbon (also known as the cao vit gibbon,*Nomascus nasutus*), which had previously been considered extinct. Following these discoveries, FFI made a long-term commitment to conserving the irreplaceable biodiversity values of these sites and primate populations have been slowly recovering since then. The project focuses on the three primates(all Critically Endangered) which are most acutely threatened with extinction — the western black crested gibbon, the eastern black crested gibbon and the Tonkin snub-nosed monkey.

Main activities

FFI's approach in stopping these extinctions can be summarised by three main themes.

(1) Community-centred

FFI works with four main minority groups in the northern limestone mountains, all of whom have been living in the area for hundreds of years. The livelihoods of these people are therefore inextricably linked with the lives of the primate species with which they share their forests and mountains. FFI with its government partners, pioneered an approach which gives local communities a voice in protected area management—the Management Advisory Committee (MAC), and empowers local people in the decision-making process. FFI has also identified potential "conservation champions" living in the minority villages near to the primate habitats. FFI employs, trains and equips these people, forming Community Conservation Teams(CCTs) . Across the northern limestone primate conservation sites, FFI employs 51 local residents in this way. Over time, FFI has built the capacity for this team to carry out high-quality, community-based gibbon monitoring and research. The team has also supported us in delivering gibbon "celebration festivals".

(2) Evidence-based

Conservation management decisions for the two gibbon species and Tonkin snub-nosed monkey are backed by the best science available. This is essential when funds are limited and species are hanging onto survival by the smallest of margins. FFI is carrying out long-term monitoring of demography and habitat-use for the elusive and Critically Endangered western black crested gibbon. Monitoring suggests that the population is now stable, albeit still very small. For the eastern gibbon, FFI maintains round-the-clock monitoring of focal groups, providing critical data on breeding and death rates, home-range sizes and habitat-use. This recently informed a Population Viability Analysis. FFI's restoration work for the cao vit gibbon, including enrichment planting of native species and assisted natural regeneration in corridors, is also underpinned by the data FFI generates from its long-term gibbon monitoring. FFI has complemented its natural science methods, with social science methods. In all three sites, FFI uses questionnaires, semi-structured interviews and village discussion groups to deepen its understanding of the viewpoints, challenges and needs of local people.

Local children participate in a gibbon celebration festival
(Ho Hai Yen/Photographer)

A Community conservation team member is patrolling (Ryan Deboodt /Photographer)

(3) Long-term

FFI has learned over its long history that a long-term, committed approach is fundamental. “Parachute conservation” doesn’t work. FFI has been working continuously for nearly 20 years, and in that time have built up a deep institutional memory and understanding of the context, institutions and local people that determine the outcomes for biodiversity in the areas. It also means that FFI is an accepted and understood local stakeholder, and means FFI has a social “license” to work in these areas. Through capacity-building with protected areas, mentorship of “conservation champions”, as well as educational work in local schools, FFI has also built a foundation upon which the next 20 years will be built. Finally, in terms of sustainable sources of funding, FFI has already pioneered a scaleable approach to unlocking Payments for Ecosystem Services from hydropower companies — this is now funding patrols in critical western black crested gibbon habitat.

Main outcomes

(1) Ecological value

The western black crested gibbon in Vietnam now remains in only a single site, with the

population of no more than 70 individuals, and it is also declining in neighbouring Laos and China countries. The eastern black crested gibbon now occurs in just a single forest block on Earth, which numbers less than 140 individuals in total. There are only 250 individuals of the Tonkin snub-nosed monkeys remaining, primarily on one site. FFI's work in the northern mountains of Vietnam has likely averted the extinction of the eastern black crested gibbon and Tonkin snub-nosed monkey, for now, and has also saved the last population in Vietnam of the western black crested gibbon.

Livelihoods—Fuel-efficient stoves
(Ryan Deboodt /Photographer)

(2) Social-economic value

The most threatened primate species in Vietnam occur in areas which are also challenging for local people poverty rates are consequently high. FFI created direct employment(part-time) of some local residents, improved livelihoods by providing low-cost fuel-efficient stoves, equipment for agriculture, micro-loans, and technical support on farming methods and market access. FFI conducts biennial surveys of local people, as well as village meetings, in order to gather evidence of our social impacts. These surveys show that the livelihoods of local people are improving, alongside pro-conservation attitudes and behaviour.

(3) Innovation

FFI in Vietnam is connected to the global network of FFI offices, providing a "local to global' link between local conservation interventions and global expertise in, for example, sustainable agriculture and biodiversity monitoring.

Application of cutting-edge conservation technology. Recent examples of this include: a bespoke gibbon data collection app; the use of SMART Connect in all of FFI's sites; the use of acoustic monitoring of gibbons using low-cost recorders("AudioMoths"), etc. These examples have proven to be important in improving the evidence-base for FFI's primate conservation.

About the applicant: Fauna and Flora International(FFI) was founded in 1903 and is the world's oldest international conservation organization. Throughout its 118-years history, FFI has championed the conservation of species and ecosystems through collaboration with, and empowerment of, local governments, social organizations, institutions and communities. This approach remains the hallmark of FFI's activities. FFI is now the lead social organization for primate conservation in Vietnam; working in ten provinces and concentrating efforts on seven highly threatened species, including five that are both Critically Endangered and endemic.

04

Coexistence with Large Wildcat —the Tigers in Nepal

Zoological Society of London

Approaches: In-situ conservation; Public participation; Sustainable use; Traditional knowledge

Targets: Forest; Grassland; Freshwater and wetland; Farmland; Flora; Mammals

Location: Nepal

Year of Implementation: 2016

Background

Tigers(*Panthera tigris*) are one of the threatened wild cat species. Ensuring their persistence is dependent on long-term conservation measures committed by tiger range countries and conservation organizations. Initiatives such as the Global Tiger Recovery Program represent the highest level of commitment to secure and recover tiger populations across their range. As per the commitment made by Nepal to increase its wild tiger population to 250 adults by 2022 from a baseline of 121(in 2009), Nepal has implemented critical conservation measures. This has resulted in an increased tiger population in Nepal to an estimated 198 tigers in 2013. However, this progress has contributed to an increase in the human-tiger conflicts (HTC) to some extent. This could compromise the coexistence policy central to tiger

Project landscape, Western Nepal Bardya National Park

conservation in Nepal.

Globally, nearly 4,000 tigers occupy a mere 6% of their historical range, yet 70% of the global population is concentrated within about 40 “source sites”. Out of which three are in Nepal comprising of five “Protected Areas” (PAs) . Protection and effective management at these sites constitute the cornerstone of global tiger conservation strategies. Since tigers naturally occur at low densities within small, protected habitats and rely on conservation measures to secure and recover them, site-specific evaluations of current and potential tiger populations, assessment of threats and development of strategies to mitigate them must guide conservation investment and action.

Hence, Zoological Society of London (ZSL) has initiated working in these complexes which includes 4 national park since 2016 through the “Integrated Tiger Habitat Conservation Program” project in these important landscapes for tiger conservation.

Main activities

The measures include the increasing tiger within the PAs and corridor forest through habitat management, and increasing community participation by providing them with alternatives to reducing their forest resources dependency and HTC mitigation measures to lessen HTC.

①ZSL, in collaboration with PAs, has been supporting local communities to initiate various alternative livelihood schemes including improved livestock farming, fisheries, piggeries, improved vegetable farming, etc. The project has provided start-up fund [for example, altogether NPR 8.85 million (USD 73633) for several 22 communities] managed as community cooperative under the buffer zone user’s communities. Among others, this fund has been utilized for ecotourism through homestays. Likewise, trainings were provided to community members of the buffer zone on promotion of ecotourism including homestay management and nature guide and other livelihood skills.

②The project has supported prioritized communities with HTC mitigation measures for human-tiger coexistence. These includes constructing predator proof corrals in identified vulnerable households to safeguard livestock, mesh wire fencing in priority locations to prevent crop raiding, and relief grant support to HTC impacted households. In addition, the project supported the awareness of raising of tiger conservation and HTC through different medias. The capacity

Predator proof corrals, Shuklaphanta Naitonal Park

of government staff in safe immobilization and translocation of problems tigers were also enhanced. The project ensured the input from local communities, local government, and PAs where relevant for the sustainability of supported interventions.

③GSM(Global System for Mobile Communications)-enabled cameras were used for the regular monitoring of the tiger especially in the conflict regions as an advance technology for mitigating HTC. These cameras were equipped with infrared flash, triggering mechanism which triggers anything passes by, and GSM SIM card that could send the alert images via email. The early warning has been effective using these cameras to avoid the human-tiger encounter. In addition, the information received from the cameras is useful to monitor the status of the tigers on a regular basis.

④The project has supported annual tiger and prey base monitoring across the tiger bearing PAs in *Nepal in accordance with the National Tiger and Prey Base Monitoring Protocol*. The project has also supported formulate the protocol to standardize survey. It clearly indicates that the numbers of tiger in Nepal have increased by 19% from 198(in 2013) to 235(in 2018) . Nepal's in-country capacity on tiger and prey base monitoring has been also improved through the support of the project to enable government staffs, conservation organizations [including National Trust for Nature Conservation (NTNC), Himalayan Nature] and local communities to conduct survey and train new staff for future surveys. ZSL has also collaborate with government and NTNC to explore the tiger habitat beyond the PA where camera trap survey has recorded four individual tigers. This suggests that the tiger habitat in Nepal is expanding, and the country is on its way to T_X^2 (doubling the tiger) by 2022.

Main outcomes

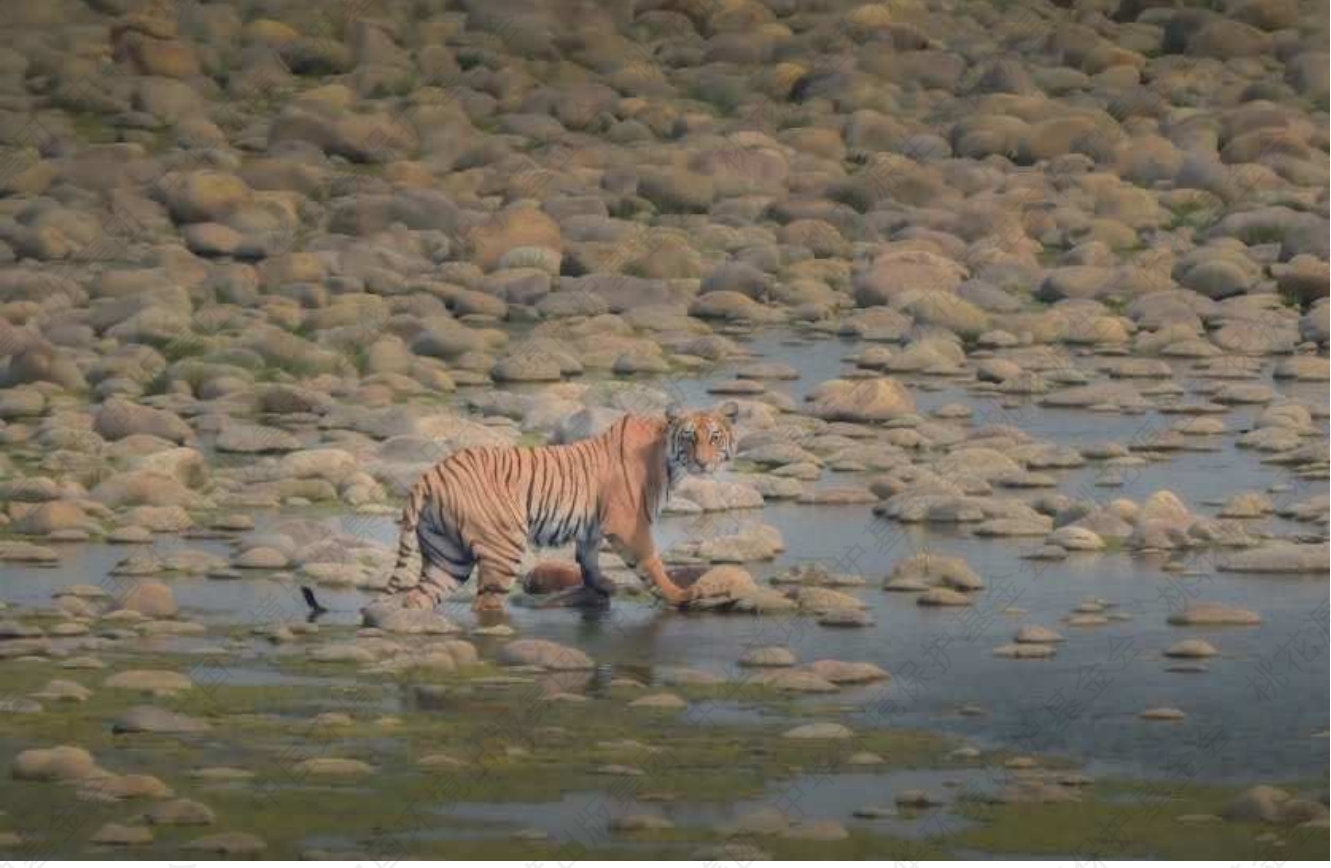
(1) Ecological value

The first survey in 2016—2017 covered 2,580 km^2 of tiger habitat across all four sites while the second survey in 2017—2018 covered 6,572 km^2 including potential habitats outside the NPs. These surveys clearly indicated that the numbers of tiger in Nepal have increased by 19% from 198(in 2013) to 235(in 2018) .

ZSL together with government anticipated the impact of climate change on tiger conservation and hence the project has been capacitating the corridor community that connects current and future tiger habitat and provide climate refuge for this threatened species.

(2) Social-economic Value

The local communities are significant for the conservation in country like Nepal where the settlement is decentralized and people are highly dependent on natural resources for their livelihood, especially poor and marginalised community. ZSL's project is helping those small holders' farmers who are poor and economically vulnerable to safeguard rural livelihoods through sustainable livelihoods schemes. The involvement of women in project supported livelihood activities has been higher than 50% and the ill-will for conservation of local communities has been changed to positively with the support from the projects.



Tigers were river bank of Bardya National Park

Project helps train the local youth for nature guide which not only provides the economic benefit to them but also prepares longer-term advocators for the conservation in local level. More than 70% of the marginalised communities benefited from the project as they are highly impacted by the HTC. The project also innovatively supports the family of HWC victims with seed fund and skill trainings to start their own interventions.

About the applicant: Zoological Society of London(ZSL) is a charity founded in 1826, is a world-renowned centre of excellence for conservation science and applied conservation. ZSL's mission is to promote and achieve the worldwide conservation of animals and their habitats. This is realised by carrying out field conservation and research in over 50 countries across the globe and through education and awareness-raising at our two zoos, ZSL London Zoo and ZSL Whipsnade Zoo, inspiring people to lead more sustainable lives and to support and enable direct conservation action. We believe in a world where wildlife thrives.

05

Save the Elephants

Save the Elephants

Approaches: In-situ conservation; Publicity and advocacy; Financial support mechanisms; Technological innovation; Traditional knowledge

Targets: Grassland; Arid and semi-arid area

Location: Oldonyiro，Kenya

Year of Implementation: 2019

Background

Wildlife species are facing threats to their natural habitats due to human population growth and infrastructural developments, as well as the effects of environmental degradation. This is placing increasing pressure on both people and wildlife as they share space and available resources. Oldonyiro is a prime example in northern Kenya.

A herd of African elephants on the move
(Daryl Balfour /Photographer)

Oldonyiro possesses a semi-arid landscape, and is situated in the Eastern Province and covers an area of approximately 625 km^2. The town of Oldonyiro is surrounded by scenic hills and escarpments both in the north and east. The resident communities are primarily nomadic pastoralists who keep livestock as their primary source of livelihood and have maintained their traditions and culture. The town is expanding at a high rate, and this poses a series of problems for the coexistence of people and African elephants(*Loxodonta* spp.) .

Main activities

More than twenty years of collar tracking data and movement analyses conducted by Save the Elephants(STE) have revealed that Oldonyiro constitutes one of the key wildlife corridors in Northern Kenya, connecting the large mammal populations in the semi-arid Samburu ecosystem with the Laikipia highlands to the South. However, the corridor is becoming increasingly blocked by ever-increasing human population pressures and an increase in the size and number of deep erosion gullies. The future of the Oldonyiro corridor represents a significant conservation challenge.

① Elephants are still managing to use the open routes, by moving at high speeds during the night to safe areas beyond human habitations. STE is therefore putting in place innovative conservation measures for human-wildlife coexistence and sustainable development as top priorities along the Oldonyiro corridor, to enable local communities to continue to live peacefully with elephants. Specifically, STE is encouraging proper management of the spread of human settlements to avoid further encroachments into the corridor. This will be achieved through improved spatial planning of the existing and upcoming infrastructure. Informatics-based approaches are shown to offer value to conservation practices in this area. For example, through demonstrations using data visualization for the local communities in Oldonyiro, some groups have already moved away from some parts of the corridor.

② Measures should also be undertaken to combat soil erosion, informed by the analysis of the environmental and conservation data. Pastoralism in this area is a key driver of soil erosion and large numbers of livestock over the years make it hard for the land to recover after rains as the vegetation cover is minimal. The paths used by livestock create small gullies that continue to expand over the years. The loss of vegetation and bare land is causing other species to grow in the Oldonyiro region such as *Acacia reficiens* and *Opuntia stricta* that have no value to humans and animals. People and their livestock as well as the elephants are criss-crossing these deep erosion gullies and being affected through injury and loss of life. STE's project will therefore investigate how to mitigate such extreme erosion events in wildlife corridors and reduce the associated costs to both humans and elephants. Meanwhile，encouraging communities to use sustainable herd sizes to avoid overgrazing and degradation is one tool STE advocates for in an effort to tackle this problem in addition to exploring measures for land restoration.

Main outcomes

(1) Ecological value

①Elephants migrate seasonally and make long journeys to satisfy their requirements for food, water, safety and mates. These large-scale movements lead to the use of migration corridors, and help reduce pressures of habitat fragmentation and confinement. The corridors are thus a crucial link between habitats for the survival of elephants. Nevertheless, as Kenya's human population and infrastructure continue expanding, the connectivity offered by corridors is increasingly being affected,

Tony and mates using Nanyuki underpass that links Lewa with the Mt Kenya Forest in Northern Kenya (Jason Straziuso/Photographer)

and Oldonyiro is no exception. Moreover, the inadequate and unpredictable rainfall in arid and semi-arid parts of Northern Kenya and recurring droughts may also become more frequent in the future due to anthropogenic climate disruptions . This means that the need for elephants to access diverse parts of the landscape in this ecosystem could be key for their survival. Due to such direct and indirect human pressures, elephants will be eventually forced to find alternative routes and change their movement behavior, with potential negative consequences on population dynamics. The conservation approach proposed by STE is helping retain landscape-scale connectivity for elephants, which ensures the long-term viability of the population relying on the Oldonyiro corridor for migration and dispersal.

②Elephants act as ecological engineers and help maintain landscape heterogeneity in semi-arid savannah ecosystems for smaller species to thrive, therefore contributing to increase in biodiversity. Their migrations contribute to seed dispersal and open routes in dense vegetation that help other mammals and livestock access resources such as water. During drought seasons, they also dig wells in dry sand beds to get water. These are invariably wells used by humans, livestock, and wildlife. STE's project in Oldonyiro is therefore contributing to secure the ecosystem services provided by these large herbivores, and unlock the value of elephants to both conservation managers.

③The local communities in Oldonyiro and their livestock farming culture help maintain the diversity of the landscape they live in. Both livestock and wildlife currently roam together over unfenced pastures enabling co-existence in the region. The involvement of STE is therefore crucial for

integrating the traditional ecological knowledge accumulated by the people of Oldonyiro into the land-use planning schemes implemented by local authorities in order to preserve these practices which can ensure the peaceful co-existence.

(2) Social-economic value

①STE's tracking data helps in landscape planning and creating awareness amongst communities, national and local governments and developers about the importance of preserving connectivity in regions such as Oldonyiro. Through these data, the spatial planning of settlement zones and infrastructure away from key wildlife migratory corridors is currently being implemented.

②Corridors can help reduce "human-elephant conflict", as proper connectivity over the landscape will ensure less interactions between elephants and humans. Wildlife and livestock corridors help both humans and elephants in their respective migrations.

③Wildlife and their corridors can be a key driver of the tourism activities and Oldonyiro can benefit from such practices and its important connectivity and the beautiful scenery. This can enable the locals to see tangible benefits of conservation and wildlife through receiving the monetary benefits that the tourists bring in. The communities can also benefit from selling their products such as traditional beads and performing traditional plays and entertainment. This conservation driven participation, can make the locals realize the need for the protection of the wildlife and the corridors.

④STE is supporting local education and providing scholarships to students in precarious economic conditions. The recipients will become wildlife ambassadors and the next generation conservationists who will continue to advocate the importance of maintaining corridors and supporting local communities.

(3) Innovation

STE is pioneering innovative developments in elephant radio-tracking technology which have revealed insights into elephant lives. It is now possible to know the details of elephant movement patterns, ranging behaviour, and interactions with each other, while also enhancing protection measures on the ground. Coupled with developments and advances in GIS, these techniques have enabled the collection and analysis of data which provide more and more information on elephant behavior, and the challenges they face across their habitats.

With the help of tracking data, STE is encouraging Oldonyiro town to create a management plan that incorporates sustainable development in the region. This can be achieved through improved spatial planning of land-use zoning for the local communities. This plan can enhance the protection of wildlife corridors through controlling settlement areas, the legislation put in place for management and enforcement for people close to the corridor to avoid further encroachment.

About the applicant: Save the Elephants is an NGO with a mission to secure a future for elephants in Africa.

06

A Colorful Life Comes From the Diversity of Nature — Yunnan Tropical Rainforest Biodiversity and Landscape Restoration Project

One Planet Foundation

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity

Targets: Forest; Flora; Mammals

Location: Xishuangbanna Dai Autonomous Prefecture and Pu'er, Yunnan Province, China

Year of Implementation: 2016

Background

Xishuangbanna Dai Autonomous Prefecture (short as Xishuangbanna) in Yunnan Province enjoys the most complete, representative and the largest tropical rainforest ecosystem in China. Tropical Rainforest of Xishuangbanna Nature Reserve is a national ecological demonstration area, and is one of the areas with the most abundant biological species in China as it consists of 1/6 plant species and 1/4 animal species in China, with a forest coverage rate of 80.8%. Its rich natural resources and complete ecosystem play an important role in biodiversity conservation and ecological balance in the lower reach of the Lancang-Mekong Region, and it is also a "paradise" for wild Asian elephants (*Elephas maximus*) .

However, local rubber and banana plantations are threatening the rainforest's biodiversity. The history of rubber plantation in Yunnan can be traced back to the 1950s. Although it has brought significant economic benefits, rubber forests are essentially pure forests, which contain only one tree species. The unscientific methods of planting rubber trees can lead to environmental problems such as soil erosion, chemical abuse, and wildlife habitat fragmentation. In recent years, as the price of rubber has fallen, bananas have become local people's favorite plant to increase income. People have begun to cut down some low-yielding rubber forests and plant banana trees instead. Nevertheless, the intensive banana cultivation also threatens soil and water conservation as well as biodiversity. With the

increasing human activities , there are more and more human-elephant conflicts have also become more frequent. Asian elephants frequently go to surrounding communities to eat crops and destroy production and living facilities.

Main activities

One Planet Foundation (OPF) in Shenzhen has been working with The World Wide Fund for Nature (WWF) in Xishuangbanna and Pu'er(two regions of Yunnan Province) for a long time. Focusing on a range of issues arising from the degradation of the local forest ecosystem, supports have been given to projects such as planting precious native tree species, exploring environmentally-friendly rubber plantations, and developing substitute economy alternative economy projects for the community. And wildlife corridors for wild Asian elephants have been further restored, so that the regional biodiversity can be improved, and the community economies can be developed.

① Establish an environmentally-friendly rubber plantation, and increase the forest biodiversity by interplanting local precious native tree species. In many townships and regions inhabited by the minority ethnic groups in Xishuangbanna and Pu'er, the OPF has provided seedlings and trainings for local forestry authorities and communities. The training help raise awareness of ecological protection and improve the technical level of introducing precious and high-value tree species, thus realizing the economic benefits of establishing environmentally-friendly rubber plantations. The Naban villagers in Naban River Watershed National Nature Reserve, Xishuangbanna, set up a "Demonstration Plot for Ecological Improvement in Low-Altitude Rubber Plantations"of 100 mu[①]. Under the guidance of agroforestry planting, the villagers have adopted the approach of different combinations of plants to plant various medicinal plants and precious trees such as purple ginger (*Zingiber officinale*), turmeric (*Curcuma longa*), *Dipterocarpus turbinatus*, *Taxus yunnanensis* under the original rubber forest.

A Rubber plantation with understory Traditional Chinese Medicine(TCM)

Musella lasiocarpa, of the Dai (an ethnic minority in Yunnan Province)

① 1 mu≈0.067 hm^2.

Demonstration plot for environmentally-friendly rubber plantation

② In order to further increase the food supply for Asian elephants and expand their living space, the project supports the Management and Conservation Bureau of Xishuangbanna National Nature Reserve to plant elephant grass, bamboo, and other foods that elephants like at the Guanping Conservation Station. This project aims at attracting the elephants to eat there instead of destroying farmers' crops. The project also expands elephant habitat and increases connectivity between habitats by using methods such as purchasing or renting farmland and restoring farmland to forests.

Main outcomes

(1) Social-economic value

The plantation of precious tree species and medicines has also helped local farmers develop alternative livelihoods. This project hopes to encourage farmers to grow both long-cycle tree species

and short-cycle crops in their rubber plantations, thereby not only increasing local farmers' income, but also protecting the ecological environment.

In order to establish a good relationship with the community, OPF has also carried out the project of "Dai National Minority Courtyard Economy Recovery Demonstration" in the Dai villages of the Naban River Watershed National Nature Reserve. OPF provided 52 household farmers with economic or traditional Dai medicines that are beneficial for development of the courtyard economy, and created planting plans for them in order to create favorable conditions for the development of the community and increase sustainable income. These demonstration sites make the surrounding farmers truly realize the diverse possibilities of sustainable alternative livelihood in the community, thereby involving them in the construction of the environmentally-friendly rubber plantations.

(2) Innovation

This practice provides an effective model for developing countries facing the challenges of biodiversity conservation and community economic benefits. It is suitable for areas such as the Greater Mekong Subregion and Africa, where biodiversity is rich but conservation efficiency is low and economic development is needed.

①Respect the culture and customs of communities living near forests. The Dai has relied on the forest for generations and has preserved their own unique culture and wisdom. While learning the current situation of the restoration of local Asian elephant habitats and human-elephant conflicts, this project also deliberately collected the related traditional knowledge of ethnic minorities on nature conservation. When selecting substitute tree species to plant, precious native tree species were recommended, and the tradition "courtyard economy" was continued.

②Focus on the livelihood of local communities. The project has improved the ability of small farmers or cooperatives to withstand market risks by promoting substitute precious native tree species with high-economic value in traditional rubber plantations, thus promoting the restoration of forest landscapes in a long-term and systematic manner. It can also prevent such situations like switching from sustainable approaches to irresponsible practices when farmers are in the face of economic pressures.

About the applicant: One Planet Foundation, is a private foundation registered in Shenzhen, China. Its purpose is to create a beautiful future where humanity and nature live in harmony by protecting biodiversity, reducing ecological footprints, and ensuring the sustainable use of natural resources.

07

Asian Elephants Conservation

Kunming COSCO Environmental Protection Technology Consulting Center

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity

Targets: Forest; Mammals; Genetic diversity

Location: Xishuangbanna Dai Autonomous Prefecture, Yunnan Province, China

Year of Implementation: 2015

Background

The Asian elephants were once found in the area of today's Yellow River Basin in Northern China. Due to the successive large-scale agricultural reclamation and wars through dynasties, the number of the Asian elephants decreased significantly. Till the second half of the 20th century, they could only be found in Yunnan. The tropical rainforest in Xishuangbanna were cut down and replaced by 464,000 hm^2 of rubber plantation. Besides, the agricultural planting areas for economic crops such as coffee and tea have also increased sharply. All these factors make it more difficult for the Asian elephants to obtain sufficient food from nature. Both human beings and elephants are depended on the large number of crops planted around the villages, causing causing the overlap of areas for activities of both human beings and elephants and making the conflicts between human beings and elephants increasingly prominent. Kunming COSCO Environmental Protection Technology Consulting Center therefore launched the "Asian Elephants Conservation".

Main activities

(1) Monitoring of ecology: Guanping Village in Mengyangzi Sub-reserve

In 2018, the project applied for 2 patents on early warning system, developed an intelligent image recognition module for the Asian elephants, completed the display system of background data, developed an automatic dispatching system for early warning, and also installed 10 phenological cameras(automatic

time-lapse digital camera), 3 sets of rain gauges and 3 sets of thermo-hygrom. In 2019, the project was promoted to villages, and the intelligent recognition module was continuously advanced through the data obtained by the infrared camera. At present, the project has deployed a total of 33 wireless backhaul infrared cameras around 5 groups from Xinzhai of Guanping Village to the fifth group near the G213 national highway to monitor 31 Asian elephant activity monitoring spots in real time.

Sound-Light Warning System

(2) Optimization of the ecological environment of habitats: Sub-reserves in Mengyang and Shangyong

In 2018, alien species and weeds in the Lengshan River of Shangyong Sub-reserve and the Lotus Pool of Mengyangzi Sub-reserve were cleared out. And the Asian elephants' favorite plants were planted. Finally, the optimization of food sources for Asian elephants within 1,500 mu was completed.

(3) Construction of habitat for the Asian elephants, and human-elephant conflicts mitigation: Noah's Ark Guarding of the Asian Elephant, the Menghai Project

①The Menghai project has completed the construction of 5 artificial nitrate ponds, 3,157 mu of the forest thinning, 1,000 mu of the prescribed burning of forest 1,300 mu of Asian elephants' favorite plants planting and the 399.8 mu of cultivated lands compensation. In total, it has optimized 5,856.8 mu food source land for the Asian elephants.

②The project has installed 24 infrared cameras, and has obtained 19,410 photos within the monitored area, of which, 551 can show the activities of the Asian elephants in the habitats optimized by the project, and 494 can show the activities of the Asian elephants near the artificial nitrate ponds built by the project.

③200 Asian elephant warning Boards and 25,000 poster foldouts have been designed and made, and were installed and distributed respectively. The science popularization picture book of *See the Asian Elephant* designed and developed by the project has been printed with 30,000 copies, which were distributed to schools in villages and towns related to the elephants.

Main outcomes

(1) Ecological value

By setting equipment such as the phenological cameras, the self-recording rain gauges and the

self-recording thermo-hygrom, the online collection of phenological image changes of the Asian elephants' favorite plants and the basic meteorology data such as temperature, humidity, and precipitation in the project area can be initially realized, so as to predict and explain the behaviors of the Asian elephants.

Planting the Asian elephants' feeding plants effectively increases the species and quantity of edible herbaceous plants in the habitat and attracts a large number of herbivores, which has ensured the survival and population restoration of wild animals in the protected area. The protection of the Asian elephant has formed an "umbrella species effect". *Bos gaurus* has been found in Lotus Pool for the first time in 20 years. The infrared cameras have taken photos of animals such as the northern pig-tailed macaque(*Macaca leonine,* a national class-I protected animal), wild boar, and silver pheasant(*Lophura nycthemera*) in the Menghai project area.

The construction of artificial nitrate ponds provides a place for the Asian elephants to supplement salt and trace elements. According to the photos taken by the infrared cameras, the Asian elephants have used the artificial nitrate ponds constructed by the project and have been active in the optimized area of the habitats.

(2) Social-economic value

From May 2015 to June 2020, the project of Monitoring and Early Warning of Asian Elephants by Guanping Village Committee in Mengyangzi Sub-reserve has recorded 293 activities of the Asian elephants, of which 266(91%) were with early warning. After the early warning was issued, there had been no face-to-face encounter between human beings and the Asian elephants in the area of the project.

Villagers around the Menghai Asian elephant habitat have been compensated for the loss of 350 mu of crops, which has alleviated the economic losses of the villagers.

The Exhibition of Achievements by Protecting the Asian Elephants held on World Elephant Day in 2019 provided an opportunity and a platform for states and cities to promote mutual learning and mutual exchanges about Asian elephant populations.

Project designed the book *See the Asian Elephants* and gave guided reading to children at Meng A Middle School

(3) Innovation

This project works together with scientific research institutes in the protected areas, government departments, and communities to jointly explore and widen the experience of protecting the Asian elephants and tropical rainforest habitats as well as the construction of food sources, which has set a good example and provided a reference for the protection and management of the Asian elephants in other regions. The work plan for the

Asian elephants (Xiong Wangxing/Photographer)

project of the Asian elephants' food source has been adopted to the *Implementation Plan for the Protection and Restoration of Asian Elephants' Habitats and the Construction of Food Source in Yunnan Province(2018—2022) (Consultation Draft)* and has become one of the main schemes to alleviate human-elephant conflicts in Yunnan Province. It has won national financial support.

About the applicant: Kunming COSCO Environmental Protection Technology Consulting Center is a local implementing agency of the Southwest Project Center of Alxa SEE Ecological Association. Kunming COSCO Environmental Protection Technology Consulting Center is committed to protecting the biodiversity of the virgin forests and plateau wetlands in the southwestern mountainous areas of China, protecting the comprehensive protection and exploration mechanism of the biodiversity in the core areas of the southwestern mountainous areas in China, and improving the in-situ conservation led and participated by local people.

08

Give Full Play to the Role of Non-governmental Organizations in Cross-border Conservation—A Practice of Ecological Demonstration Village at Poverty-stricken Ethnic Minority Villages in the Cross-border Asian Elephants Protection Area of Laos

Yunnan Green Environment Development Foundation

Approaches: In-situ conservation

Targets: Forest; Mammals

Location: China and Laos border area

Year of Implementation: 2019

Background

Asian elephants, one of the national class-I key class protected wild animals in China, have been listed as an endangered species by IUCN, and has been listed in Appendix Ⅰ by the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) . The Asian elephants were once widely distributed across China, but the wild Asian elephants in China are now only found in the southern part of Yunnan Province. There are five herds of cross-border Asian elephants living along the border between Mengla County, Dai Autonomous Prefecture of Xishuangbanna, Yunnan Province and the Laos. With a wild environment where complete and concentrated habitats suitable for elephants are preserved, this area has become an important habitat for the Asian elephants. The Asian elephants often roam around the borders of the two countries that are relatively remote and underdeveloped where frequent illegal activities such as deforestation and poaching frequently take place due to relatively weak management from the governments.

The local long-dwelling residents have maintained the lifestyle of surviving on mountains and kept the habit of hunting, thus being very dependent on natural resources. In recent years, as the

population continues to grow, people have extensively developed the land and overused the natural resources, which has turned a large number of virgin forests into farmland. Meanwhile, human activities of the local residents, such as burning forests and destroying mountains to plant economic crops such as rubber and tea, have led to a sharp decrease of the area of the virgin forests. Consequently, the Asian elephants are faced with a constantly deteriorating environment and have to compete with humans for limited resources and living space.

Main activities

In order to protect the Asian elephant population at China -Laos border and to mobilize Lao's local communities to participate in the protection of the Asian elephants and their habitats, in 2019, Yunnan Green Environment Development Foundation(YGF) and The Management and Conservation Bureau of Xishuangbanna National Nature Reserve with the support of the Department of Commerce of Yunnan Province, China, and in cooperation with the forestry departments of Laos, carried out a community pilot project in a village on the Laos side of the "China-Laos cross border biodiversity joint protection area". By combining the working method of the ecological demonstration village with the needs of local protection and community development, this project has been recognized and welcomed by the local governments and villagers. The forestry departments of, Laos, hopes to take such cooperation as an example, and suggests that the Lao government open up non-governmental cooperation on ecological protection in the border areas.

This project, based on the China- Laos cross-border biodiversity joint protection cooperation framework established by China and Laos, as well as the joint protection plan developed by the prefecture government of Xishuangbanna, has given full play to the advantages of social organizations in promoting exchanges and cooperation at the people-to-people level between the two countries. With the cooperation among YGF, the governments and the communities, various forms of work have been organically integrated including the protection advocacy training, capacity building of community participation in the ecological protection and the advancement of sustainable development of the community.

Community joint patrol training in Laos

Assisting Laos communities to reduce their dependence on forest resources by fuel-efficient stoves

Main outcomes

(1) Ecological value

Asian elephants often go into villages in Laos during their foraging and migration in the border areas, causing casualties and property losses to villagers, and as a result, the local "human-elephant conflicts" become quite serious. Located only 1 km from China's borderline and within the northern part of the core area of the China-Myanmar biodiversity hotspot, the project village is one of the top ten irreplaceable biodiversity hotspots in the world, one of the seven important cross-border biodiversity conservation areas in the Lancang River, and a key cooperation area for China-Laos cross-border biodiversity conservation, so it is of great importance to protect this area. This project can reduce local people's reliance on and damage to natural resources to a large extent, which is conducive to the preservation and conservation of the Asian elephant conservation habitat.

(2) Social-economic value

This project helps to better address and alleviate the conflicts and contradictions between human beings and elephants, and at the same time, improves the living standards of the villagers on the Lao side in the Asian elephant protection area.

Local forest rangers and respected villagers living in the cross-border joint protection area are invited to Xishuangbanna for face-to-face communication. China and Laos continue to carry out joint patrol work, define patrol routines in the cross-border joint protection areas, and invite personnel from each other to participate in patrol work. On this basis, this project has helped reduce the fuelwood resource consumption in the local area, avoid "human-elephant conflicts", improve the living conditions of the villagers, and enhance the ability and enthusiasm of the villagers to participate in ecological conservation. Therefore, this project not only embodies the conservation of wild animals, biodiversity and ecosystems, but also shows a good example of neighbors' friendships between the peoples along the border areas.

(3) Innovation

This project is a useful supplement to the joint protection of China and Laos that are connected by mountains and rivers at the border and have shared customs and cultures. Both sides attach great importance to biodiversity protection. In 2006, the Management and Conservation Bureau of Xishuangbanna National Nature Reserve and relevant Laos governmental departments established an annual meeting mechanism and started cross border joint protection. Over a decade of paying efforts to the conservation work, the two sides have established a relatively complete of cooperation ways such as joint patrols and conference exchanges. Against the background of a good cooperation, this project involves local Laos communities in the protection for the first time, which is a non-governmental supplement to the joint protection at the government level.

Assisting Laos communities with fuel-efficient stoves to reduce their dependence on forest resources

About the applicant: Yunnan Green Environment Development Foundation(YGF) was founded in January 2008. It is a local public-raising foundation registered in the Department of civil affairs of Yunnan Province with its business directed by the Yunnan Forestry and Grassland Bureau. It is mainly engaged in eco-environmental conservation and remains committed to promoting endangered wildlife conservation, forest vegetation restoration, rural sustainable development, ecological poverty alleviation in Yunnan, etc.

09

Restoring the Wilderness and Take the Leopard Home

Chinese Felid Conservation Alliance

Approaches: In-situ conservation; Public participation; Publicity and advocacy

Targets: Species diversity; Mammals

Location: North China wilderness

Year of Implementation: 2017

Background

North China leopard (*Panthera pardus japonesis*) is a unique subspecies of leopard in China, and its type specimen was collected from the mountainous area in the west of Beijing. The existence of leopard (*Panthera pardus*), a large carnivore, means the integrity of the forest ecosystem. Historically, the North China leopard was widely distributed in north China. But due to habitat loss, illegal poaching, and other reasons, there are only a small number of isolated populations of the North China leopard in the Taihang Mountains, and the Ziwuling Mountains. The leopard hasn't been found in Beijing, its original hometown, for many years. In April 2017, with years of efforts in North China Leopard Conservation Project in Shanxi Province, Chinese Felid Conservation Alliance (CFCA) launched project of "Take the Leopard Home", which aims at protecting and restoring the existing North China wilderness so as to make the North China

Schematic diagram of Taking the Leopard Home

leopard naturally return to Beijing and spread along the Taihang and Yanshan Mountains.

Main activities

(1) Scientific assessment

CFCA believes that effective protection must be based on scientific assessment. Since 2013, the CFCA has cooperated with universities and colleges such as Beijing Normal University, Peking University and Tsinghua University to launch the following monitoring and evaluation activities: by infrared camera monitoring, CFCA found that the population of North China leopard in Heshun County, Jinzhong City in Shanxi Province has a strong reproductive capacity with stability, which can be used as a source population to return to Beijing; through habitat simulation analysis, CFCA found that several potential habitats of North China leopard such as Tuoliang Mountain and Xiaowutai Mountain, could be the first tier recovery areas of North China leopard; through the current model of the wilderness, CFCA found the unsafe zones that the leopard may encounter during the process of returning to Beijing, such as highways and residential districts, which exactly revealed that how to secure the route to return would be one of the main problems. Besides, CFCA has carried out research to assess the impact of the two main human interferences, i.e., highways and grazing, on the North China leopard and its habitats.

(2) Community participation in in-situ conservation

Carry out such conservation campaigns including community anti-poaching patrol, compensation for leopard eating cattle, and damage prevention and control of wild boar, so as to gradually eliminate key threats to the North China leopard and its habitats.

(3) Public participation in publicity & advocacy

CFCA believes that ecological conservation needs public participation. Since the implementation of this project, the CFCA has always been publicizing ecological and scientific knowledge and advocating public participation in the protection by means of self-media communication and offline activities. In 2020 alone, the CFCA WeChat official accountant's public reading quantity reached 1.67 million, and the Weibo accountant's reading quantity reached 200 million. 26 offline activities were held and more than 10,000 participants.

(4) Government cooperation

Given the identified threat factors, the CFCA established a communication and feedback mechanism with the relevant governments where the North China leopard core habitat is located. In 2019—2020, the CFCA submitted ecological impact assessment reports on the leopard population and its habitats of relevant projects to the government.

Main outcomes

(1) Ecological value

Since the middle of the 20th century, the loss of the historical distribution area of the North China

North China leopard

leopard has been particularly serious, with only 2%~4% remained. The existing population is small and highly dispersed, facing extremely serious human disturbance. The North China leopard is the top predator and key species in the forests of North China. However, compared with other flagship species such as the giant panda (*Ailuropoda melanoleuca*), tiger and snow leopard (*Panthera uncia*), the North China leopard has received relatively little attention and research, and few resources have been invested into the research and protection of the North China leopard. Therefore, paying more attention to the conservation and restoration of the North China leopard population is of vital importance, which will also promote biodiversity conservation.

(2) Social-economic value

This project cooperated with Tsinghua University, Peking University, and other universities to carry out ecological corridor evaluation and release relevant papers and reports, thus providing an overall methodology and macro landscape for ecological corridor construction in North China. The monitoring research and evaluation of the North China leopard provides scientific references for the monitoring of the North China leopard and the biodiversity conservation in North China.

This project assisted the forest public security officers in law enforcement, recorded and submitted

more than 20 cases of poaching to help police educate or arrest more than 10 poachers. Anti-poaching publicity and advocacy was also carried out throughout north China to enhance the awareness of wildlife protection and the legal consciousness.

The ecological compensation for ecological damage of "leopard eating cattle" and the prevention of "wild boar eating crops" have been carried out continuously for four years, which reduced the economic loss of community residents and the threat of the decline of North China leopard population caused by retaliatory hunting.

In the past four years, this project has been covered on multiple media platforms including China Central Television(CCTV) News and Xinhua News Agency. Together with more than 100 offline activities held by CFCA, this project has attracted more than 100 million viewers.

(3) Innovation

①It is the first project focusing on the conservation of the North China leopard initiated by social organizations. The North China leopard was rarely studied by scholars before the 21st century. The early surveys were mostly subsidiary products of studying other flagship species such as the giant panda. "Taking the Leopard Home" project is the first project initiated by social organizations in China focusing on the conservation of the North China Leopard and its habitats.

②It is a project with interdisciplinary conservation. The ultimate aim of "Taking the Leopard Home" is realizing the harmonious coexistence of the North China leopard and human beings. This project not only focuses on the monitoring and research of the North China leopard and the in-situ conservation, but also makes efforts in the fields of human-animal conflicts compensation, development and promotion of ecological agricultural products, public advocacy, and nature education in the communities.

③It is a conservation action based on scientific assessment: Conservation strategies must be made based on the law of fact to achieve results. This project is based on scientific investigation and evaluation. In the fields of the dynamic research of the population of North China leopard, habitat simulation, and assessment of road and grazing threats, CFCA has cooperated with professional scientific research institutes to precisely design assessment methods and produce scientific evaluation results.

About the applicant: Chinese Felid Conservation Alliance(CFCA) is a non-profit organization focusing on the protection of 12 species of wild felids native to China. It has made assessment of wild felids conservation, formulated in-situ conservation strategies, and promoted the coexistence of humans and wild felids through public advocacy for a long time. The CFCA closely cooperates with many reserves, governments,governments, scientific research institutes and other institutions in China. It has been conducting field monitoring for more than 10 years. The survey area covers 13 provinces and municipalities directly under the central government.

10

Promote the Participation of Communities in the Yanchiwan Area of Qilian Mountain National Park in the Snow Leopard Conservation

Eco-Bridge Continental

Approach: In-situ conservation; Public participation; Publicity and advocacy; Technological innovation; Sustainable use of biodiversity

Targets: Species diversity; Mammals

Location: Yanchiwan Area of Qilian Mountain National Park, China

Year of Implementation: 2019

Background

Located in the southeast of Mongolian Autonomous County of Suber, Gansu Yanchiwan National Nature Reserve is an extremely large wildlife nature reserve, which focuses on the protection of rare wild animals in plateaus, such as the snow leopard, white-lipped deer (*Cervus albirostris*), wild yak (*Bos mutus*), and Tibetan gazelle(*Procapra picticaudata*) . It covers an area of 1.36 million hm^2. There are two villages in the nature reserve: Yanchiwan Township and Shibaocheng Township. In addition, some areas of Yuerhong Township are also within the scope of the nature reserve. The total number of households in the community is 289, with a permanent population of less than 1,000. The community's economy in the nature reserve is dominated by animal husbandry and supplemented by planting industry.

According to the nation functional zoning system, Gansu Yanchiwan National Nature Reserve has been identified as an ecological reserve and a water source protection zone. And it has also been granted as the system-oriented pilot area of the Qilian Mountain National Park. The prohibition of large-scale construction activities has effectively protected wild animals especially the snow leopards. However, the snow leopards and other species in this area are still facing various threats, mainly including habitat fragmentation, livestock grazing, climate change and lack of community support for protection.

The loss of biodiversity may not only cause "ecological collapse", but also directly affects ecosystem services, thereby affecting human's life. Furthermore, the conflicts between human beings and wild animals are the major determinants of the loss of biodiversity, and are also the consequences caused by the loss of biodiversity. However, so far, there are still few studies on how the conflicts between human beings and animals are caused by the loss of biodiversity. In this regard, the Eco-Bridge Continental(hereinafter,Eco-Bridge) has made useful explorations through this project.

Main activities

This project has improved the snow leopard patrolling and monitoring system in the Yanchiwan area, and carried out protection activities such as technical pilots for improving corrals, livestock insurance and compensation plans, and ecosystem health plans, so that community-based forces to protect snow leopard can be enhanced, and human-animal conflicts can be alleviated. Therefore, it is possible to promote the health of the snow leopard and the integrity of its ecosystem, and achieve the sustainable development of the local communities.

(1) Strengthening scientific research monitoring & Cultivating community conservation force

Eco-Bridge has conducted skills trainings on snow leopard patrol twice for the staff of Yanchiwan Protected Areas Administration Bureau, and cooperated with the reserve to add 4 new monitoring sites. Through skills training, a group of herdsman rangers who are familiar with snow leopards' activities and can independently deploy infrared cameras have been developed. They have photographed snow leopards, dholes (*Cuon alpinus*), brown bears (*Ursus arctos pruinosus*), lynx (*Lynx lynx*) and other wild animals for many times, leaving precious images and data.

(2) Supporting sustainable livelihoods & Reducing losses caused by wild animals

Through community surveys, Eco-Bridge has learned more about wild animal accidents in the Yanchiwan area, and has designed 3 sets of technical solutions for improving corrals including electric fences, light driving and alarm driving systems. Eco-Bridge also installed corral improvement devices for 12 herdsmen who actively participated in the project, hoping to reduce the harm caused by the wild animals.

Eco-Bridge, the reserve and various stakeholders jointly held the "Seminar on the Livestock Insurance and Compensation Plan in Subei County", hoping to reduce the losses caused by conflicts between local herdsmen and wild animals by optimizing compensation and insurance mechanism for wild animal accidents.

Na Yin, a herdsman ranger, is setting up an infrared camera

Electric fence

(3) Science popularization & "One Health" of ecosystems

Eco-Bridge cooperated with the Animal Husbandry and Veterinary Bureau of Subei Mongol Autonomous County to vaccinate 194 sheepdogs against rabies. Eco-Bridge hopes to protect the health of wild animals in the reserve and realize the goal of "One Health" of the ecosystems by protecting the health of the sheepdogs in the pastoral area.

Eco-Bridge carried out a wide range of publicity campaigns about epidemic sources and epidemic-related knowledge in local communities, and promoted the concept of "One Health" of the ecosystems. In addition, science popularization on wildlife and ecological protection has been carried out in local communities and schools.

Main outcomes

(1) Social-economic value

The implementation of measures such as the “corral improvement plan” and “insurance and compensation plan” can secure the basic life of local community residents, and lead to the coordinated development of local community economy and natural resources protection.

(2) Innovation

This project is an innovative project that combines wildlife protection, sustainable livelihoods and community participation. The relevant results and experience obtained from the project can be extended to other protected areas of the same type, and at the same time, long-term scientific and technological theoretical support and practical instruction will be provided for the future planning and construction of national parks.

Vaccinate a sheepdog against rabies

About the applicant: Eco-Bridge Continental was founded in 2015. It is dedicating to nature conservation of China. Since its foundation, Eco-Bridge Continental has established a strategic partnership with the Wildlife Research Institute of Beijing Forestry University. And it focuses on the protection of terrestrial flagship species including snow leopards and Asian elephants, adheres to the concept of paving the way for building a prosperous and harmonious society, pays attention to forests, grasslands, wetlands, deserts and other terrestrial ecosystems, carries out scientific research on wild animals and ecological protection practices, explores strategies for the coexistence between human beings and nature, and promotes the development of ecological civilization construction.

11

Everest Snow Leopard Conservation Plan

Vanke Foundation

Approaches: In-situ conservation; Financial support mechanisms

Targets: Forest; Grassland; Freshwater and wetland; Mountain; Flora; Mammals; Avifauna

Location: Mount Qomolangma National Nature Reserve, China

Year of Implementation: 2013

Background

Snow leopards, known as "the king of snowy mountains", live on the snow-capped plateaus and snowy ridges. According to a rough estimate by scientists, the total population of existing snow leopards globally is around 7,446 to 7,996 (in 2016), which are distributed in 12 countries, all located in Asia, especially central Asian countries. About 60% of the snow leopard habitats locate in China. Due to various factors including climate change, illegal poaching and habitat degradation, the snow leopards are facing with serious threats for survival and in need of urgent protection.

The Everest region in Tibet Autonomous Region is an important habitat for snow leopards in China. In 2013, Vanke Foundation established a strategic partnership with the Forestry and Grassland Administration of the Tibet Autonomous Region to jointly release the "Everest Snow Leopard Conservation Plan".

Main activities

①Set up Mount Qomolangma Snow Leopard Conservation Center. In May 2014, Vanke Foundation and Mount Qomolangma National Nature Reserve Administration jointly set up the Mount Qomolangma Snow Leopard Conservation Center, funded by Vanke Foundation(RMB 2 million per year, total investment of RMB11 million by 2020), with the former in charge of recruiting personnel for the center and the latter determining the business direction and coordinating administrations at all levels for the implementation of this program. It aims at jointly exploring effective ways to carry out

The snow leopard family at the foot of Mount Qomolangma, photographed by an infrared camera

species conservation in the Everest region by combining the direction and stability of government management, the flexibility of social organization implementation, and the universality of the resource.

②Promote Mount Qomolangma Snow Leopard Conservation Plan to be launched. Based on the concept of "Conservation By design",the Mount Qomolangma Snow Leopard Conservation Center has built the Conceptual Model of Snow Leopard Conservation in the Mount Qomolangma Reserve and developed the Mount Qomolangma Snow Leopard Conservation Plan. From 2014 to 2017, this plan focuses on researching the Everest snow leopard population and their habitats, with 523 infrared cameras deployed in the area of 1,936 km^2 to identify the distribution and survival status of Mount Qomolangma snow leopards, From 2017 to 2020, investment has increased in supporting the livelihood development of local communities, improving the capabilities of protection teams, and promoting knowledge dissemination to the public, etc. The center has funded over 10 specialized researches and training sessions, helping the Mount Qomolangma Reserve complete the protection management mechanism, and improve the abilities of frontline protectors. This project has also allocated small grants to support the infrastructure upgrading in the communities, conducted a complete survey on the communities within the Mount Qomolangma Reserve and assisted cooperatives to explore the livelihood transformation path in local communities.

③Establish Cooperation Network for Mount Qomolangma Snow Leopard Conservation. Being adjusted and optimized closely in line with the specific conditions of the Mount Qomolangma, the working mechanism of the Mount Qomolangma Snow Leopard Conservation Center has undergone a model transformation from being "business-oriented" to "platform-oriented". By the end of 2020, the Cooperation Network for Mount Qomolangma Snow Leopard Conservation has been set up, and an expert panel with 4 scientific research universities as the core strength has been formed. Meanwhile, aided by the center, active exploration has been conducted on the innovation and optimization of mechanisms for conserving the Mount Qomolangma snow leopards and their habitats, in conjunction with partners in various fields such as species research, community development, conservation management and natural image dissemination.

Main outcomes

(1) Ecological value

The Mount Qomolangma National Nature Reserve, covering a total area of 33,800 km^2, has an extremely high mountain landscape group represented by Mount Qomolangma, as well as the geographical characteristic of two natural geographical units, the Southern Tibet Plateau and the Central Himalayas. Such special geographical location, complex natural conditions and diverse climates have contributed to rich biodiversity in the reserve, among which snow leopard is a typical representative. Since its implementation, the Everest Snow Leopard Conservation Plan has has promoted Mount Qomolangma biodiversity conservation, with snow leopard, the flagship species, as the starting point to protect the unique ecological environment of Mount Everest.

Patrol at Cho Oyu Base Camp

(2) Social-economic value

①The Mount Everest is a world-renowned iconic site with a complex and unique ecosystem. However, due to factors like climate, geopolitics, social atmosphere and the like, few non-profit organizations get involved in social governance attempts in this region. The Everest Snow Leopard Conservation Plan has by so far become the only cooperation program carried out by social organizations in the Mount Qomolangma Reserve.

②The Mount Qomolangma Snow Leopard Conservation Program integrates policy support, scientific research and traditional culture, and attaches importance to the close integration of national and local supporting policies and scientific foundations like conservation biology with the local Tibetan's knowledge about ecological culture conservation. During the design and implementation period, according to the relevant policy, this conservation plan fully respect the traditional local habits and cultural spirit, in an objective, pragmatic and understanding attitude, and promote the local communities to participate in the biodiversity conservation based on the modern scientific concepts.

(3) Innovation

①An innovative model for cooperation: The "Mount Qomolangma Snow Leopard Conservation Center" was jointly created and managed by the relevant conservation management administrations and social organizations. Reference can be provided in ecological conservation in Tibet by such model of complementary cooperation of "government+foundation" offering policy and funding support and a "professional scientific research team" launching and implementing the conservation .

②During the formulation of the conservation plan, an innovative approach that considers both "responding to the existing problems" and "preventing new problems" has been developed. The formulation of the conservation plan in the "Everest Snow Leopard Conservation Plan"is forward-looking as it, based on various solid specific baseline surveys, not only pays attention to addressing existing problems(such as wildlife accidents), but also draws on the experience of and idea of similar projects worldwide so as to design and implement the corresponding conservation plan that can prevent and cushion the impact of potential issues(such as climate change) .

About the applicant: Vanke Foundation is a national private foundation initiated by Vanke Enterprise Co., Ltd. and approved by the Ministry of Civil Affairs and the State Council. It was founded in 2008 with its business authority under the Ministry of Civil Affairs. In 2017, it was recognized as a charitable organization. By the end of 2020, the Vanke Foundation has accumulated 630 million RMB in public welfare expenditures in many fields such as community waste management, development and environmental protection(including biodiversity conservation), disaster relief and epidemics resistance, protection of ancient buildings, and education .

12

Yunlong Tianchi Multi-benefit Forest Restoration Project

GAC Toyota Motor Co., Ltd.

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity

Targets: Forest; Species diversity

Location: Yunlong Tianchi National Nature Reserve and its surrounding communities, Yunnan Province, China

Year of Implementation: 2017

Background

In March 2014, a wildfire broke out in the forest of Haicang Village, Gongguoqiao Town, Yunlong County, Dali Bai Autonomous Prefecture, Yunnan Province, destroying about 4,200 mu of vegetation. In 2015, Yunlong Tianchi National Nature Reserve found the footprints of Yunnan snub-nosed monkeys(*Rhinopithecus bieti*) on the back of the burnt hills, which renews the southernmost distribution of the Yunnan snub-nosed monkeys . The restoration of vegetation in this burnt area is crucial to the habitat protection of the Yunnan snub-nosed monkeys. Furthermore, the Yunlong Tianchi and its surrounding wetlands and Bai villages are very rich in natural scenery and anthropological spectacles, with a variety of unique agricultural products, thus being highly valuable for the development and promotion of natural experiences and ecological products.

Main activities

GAC Toyota Motor Co., Ltd.(hereinafter GAC Toyota) cooperated with China Green Foundation, Shan Shui Conservation Center, and Yunlong Tianchi National Nature Reserve Management and Conservation Bureau, and integrated multiple resources to carry out the project of Multi-benefit Forest Restoration Project for Yunlong Tianchi Multi-benefit Forest Restoration Project from 2017 to 2021.

①Multi-benefit forest restoration was scientifically and effectively carried out. During the five-year

implementation period of the project, a total of 1,000 mu of burnt area in Wubao Mountain State-owned Forest Farm were restored in batches, and a total of 173,300 native tree species were mixed and planted to restore the ecological functions of Yunnan pine(*Pinus yunnanensis*) forests. The project organized local villagers to patrol the forest, during which 400 mu of restored forest area was pruned and fertilized, and carried out other nurturing measures to promote the renewal of Yunnan pine forest manually.

②Establish a long-term scientific research monitoring system to evaluate the effectiveness of restoration. Since 2018, comprehensive monitoring of biodiversity indicators such as meteorology, birds and mammals, insects, soil, and water quality in the burnt areas has been continuously carried out to clarify the succession of ecosystems under different interventions and restoration methods after fire disturbances, which provides a theoretical basis for guiding the post-fire ecosystem construction and reasonable manual intervention.

③Organize Nature Watch festivals and scientific volunteer activities to widely disseminate the values and concepts of this project and promote public participation in the conservation. During the activities, participants photographed a total of 822 species of animals and plants, including 289 new records of the reserve, 1 new plant species(to be published), and 3 new insect species. The project has compiled an animal and plant handbook and a community guidebook for the reserve.

Community involvement in burn site nurturing

Scientific research monitoring on burnt areas

A scientific volunteer activity in 2020

Main outcomes

(1) Ecological value

While conducting forest ecological restoration, this project helped restore the habitat of the endangered species, Yunnan snub-nosed monkeys, enhanced the carbon sink function of the forest ecosystem in the project area, and gave full play to the multiple benefits from the forest in terms of biodiversity protection, water conservation, and improving the ecological environment and natural landscape.

(2) Social-economic value

This project assisted cooperatives in selling eco-friendly products through capacity building and product development practices. By electing forest ranger guides and community natural experience host families, the local villagers had a new concept and understanding of sustainable use of surrounding forest resources. While increasing the income of the villagers, the project fully mobilizes the enthusiasm of the villagers to participate in protection, and provides new ideas and directions for local ecological poverty alleviation in Yunlong County.

(3) Innovation

This project provides a demonstration involving multiple parties for forest management in China.

About the applicant: GAC Toyota Motor Co., Ltd. always adheres to environment-friendly ideas in its business activities. It encourages the employees, customers, partners and the public to actively participate in environment-friendly public welfare activities such as tree planting, ecological construction and nature protection, thereby contributing to public welfare undertakings of China in nature protection.

13

Governance and Development of Qunan White-headed Langur Community Reserve in Guangxi Zhuang Autonomous Region

Guangxi Biodiversity Research Center

Approach: In-situ conservation; Policy-making & implementation; Financial support mechanisms; Sustainable use of biodiversity; Traditional knowledge

Targets: Forest; Mammals; Germplasm resource conservation

Location: Qunan White-headed Langur Community Reserve Guangxi, Zhuang Autonomous Region China

Year of Implementation: 2014

Background

Qunan is a Zhuang ethnic village in Fusui County, Chongzuo City, Guangxi Zhuang Autonomous Region (hereinafter,Guangxi). It has a history of nearly 300 years, and retains the traditional knowledge-practice-belief complex of the Zhuang ethnic groups. The Fengshui forest of the village is considered to be closely linked to the wellbeing of the village. It helps protect the water sources of the village and prevent natural disasters such as landslides and rolling stones. It is also a shelter for many plants and animals.

Qunan is situated in the karst stone hilly area and located in the Indian-Burmese biodiversity hotspot area, and is an important habitat for a critically endangered species, the white-headed langur.

The habitat of the white-headed langur(*Trachypithecus leucocephalus*) belongs to a collective forest of the community. In order to obtain full support from the villagers for ecological conservation, in 2014, the Qunan Tun Committee, with prior acknowledgment and consent from all the villagers, raised fund to establish a self-managed reserve. The reserve was approved by the County Forestry Bureau in the form of natural protection community. The whole village agreed to be registered in United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC, is an international biodiversity conservation data agency established by the UNEP to protect the world environment), thus being recognized globally.

Main activities

After being registered in the UNEP-WCMC, Guangxi Biodiversity Research Center cooperated with Qunan Tun Committee to carry out the following works.

A ranger and a docent are explaining white-headed langur together

A community reserve management team, which has a clear division of labor and performs its own duties in finance, government relations, publicity and patrol, was established under the Tun Committee. The team promotes community participation in the formulation of village regulations and protection plans by convening co-management meetings, and establishes an internal consultation mechanism. Unlike the reserve established by the government was established under the Tun Committee, the management and decision- making of the Qunan community reserve does not rely on the usual management system, but rely on common law and the joint supervision of villagers.

Collective art performance in Qunan Community. Guo Xiaoying/Photographer

Benefiting from good ecological and cultural conditions, Qunan cooperated with nature education institutions to build a nature education base , which is also a platform for people from all over the country to get close to nature and carry out educational activities, thus promoting environmental-friendly development. The villagers partook in the camp construction, thus allowing the community groups to be engaged in nature education business activities, and participate in or independently provide folk culture courses. An effective democratic discussion and decision-making mechanism has been gradually established between the community groups and the Tun Committee.

Patrol members attend a training of infrared camera installing and using (Ba Nong/Photographer)

Main outcomes

(1) Ecological value

Since the establishment of the Qunan Community Reserve, the number of the white-headed langurs has increased constantly, and the distribution area of the langur population has expanded. The illegal poaching or gathering of wild animals and plants as well as habitat destruction have been eliminated. Before the establishment of the Community Reserve, a 2012 survey in the reserve showed that there were only about 50 white-headed langurs in Qunan. Later, the monitoring in 2018 showed that the population of white-headed langurs had increased to about 160.

The willingness of villagers to protect and supervise the reserve has increased significantly. Since the establishment of the Community Reserve, more than 90% of the damage has been reported by the villagers.

After the implementation of the ecological public welfare forest project, the forest has been protected, the vegetation on the rock mountain has been continuously restored, and the habitats have not been encroached on by any villagers.

(2) Social-economic value

①Empowerment and management: The Community Reserve is recognized by the government, and adopts the method of self-financing, self-construction, self-management and self-benefiting. The Tun Committee and management team actively listens to villagers' opinions, allows the villagers to

participate in decision-making and benefit from this. The villagers' attitude towards the Tun Committee and the village committee has improved significantly. They also gave more trust and support to the government. Vulnerable groups(such as women and children) in the community are encouraged to participate in activities and public affairs as community groups, which has improved the grassroots governance space and has significantly increased public activities in the community.

②External relations and influence : Qunan has established good relationships with government departments, public welfare organizations, and enterprises through the Community Reserve, and has established cooperative relationships with partners in the nature education and eco-agriculture industries. Qunan's social influence has been increased significantly.

(3) Innovation

①Effective grassroots governance and organizational construction assist in administrative management. The co-management committee under the supervision of the villager group represents the grassroots democratic consultation platform and assists in the grassroots management of the Tun Committee. The participating community groups organize and encourage the public from ecology, economy, culture, and public services to achieve common development.

②The development of the nature education industry and the exploration of farmers' cooperative economy. With the importance of nature education, the community took into account the need for collective and individual benefits. It negotiated and developed a set of benefit distribution mechanism to ensure the collective sharing of ecological benefits. At the same time, it motivated and increased community participation in the market mechanism as much as possible, so farmers can directly benefit from the industry chain, and are further encouraged to actively participate in the development of ecological industry.

③Make the community is the main body, which builds a path for farmers' ecological development with multiple parties. Focusing on ecological protection and development, the farmers' income has increased. With a multi-participation investment channel involving the government, the public society and the market has been opened. In this way, the ecosystem service value created by the farmers can be realized, and the main position of the community in rural governance and development can be reaffirmed.

About the applicant: Guangxi Biodiversity Research Center(BRC) is a charitable organization registered in the Guangxi Civil Affairs Department in 2014 and managed by the Guangxi Forestry Bureau. The purpose of the BRC is: on the basis of scientific research, fully considering the needs of local people, encouraging public participation, and choosing sustainable solutions to protect the endangered species and key ecosystems of Guangxi.

14

Mengxin Beaver Protection Series Projects

Nature Conservation Association of Altay Region

Approaches: In-situ conservation; Public participation; Publicity & advocacy

Targets: Mammals

Location: Ulungur River Basin in Altay Prefecture, China

Year of Implementation: 2018

Background

The Ulungur River Basin in the Altay Prefecture, with Ulungur Lake as its tail, is the only habitat of the Mengxin Beaver (*Castor fiber birulai*) in China, a national class-Ⅰ key protected wild animal, which is also known as the "engineer of the animal kingdom". The shrub willow(*Salix saposhnikovii*) growing in the Ulungur River Basin is an essential factor for the survival of the beavers. It is not only their food but also the "building materials" they use to build nests and dams. In recent years, due to climate change and other reasons, the shrub willows in the Ulungur River have been facing problems like aging and significantly reduced planting area. Insufficient food and environmental capacity have become the main factors restricting the development of the beaver population. At the same time, the local area has long been constrained by its remote location and the below-average economic development, so that nature conservation has always suffered from a "talent shortage", that is, the difficulty of recruiting permanent workers, and there is a shortage of staff, professional wildlife veterinarians and conservation personnel.

Main activities

In response to the survival plight of the beavers, Nature Conservation Association of Altay Region (hereinafter ,as Altay NCA) initiated three public welfare projects for the protection of the beavers: 420,000 shrub willow saplings were planted for beavers as a "Beaver Canteen", which greatly improved the food resources and the environment of the beavers' habitat; "Beaver Guardians" mobilized 190

Beavers photographed in the wild

herdsmen in the Ulungur River Basin to become non-profit rangers, thus solving the problem of the shortage of personnel in nature conservation. And "Beaver's Ark" built the first professional medical rescue center for the beavers in China, which greatly reduced the accidental death rate of the beavers.

During the three years, the above-mentioned projects have cooperated with the local government, many domestic nature conservation foundations and enterprises. These projects have won the support of more than one million netizens. It has successfully increased the beaver population from 500 to 598, with the highest increase by 20% in nature conservation of China.

Main outcomes

(1) Ecological value

①The Mengxin Beaver is known as the "engineer of the animal kingdom". The dam it built can be considered a small wetland and a small habitat, providing a home for more animals. After the implementation of Sino-Mongolian Beaver Protection Series Public Welfare Projects, the habitat of the beaver has been greatly expanded. According to observation data, the newly built beaver nests have

Planting trees in the "Beaver Canteen"

created new habitats for more birds, fish and mammals, therefore having a positive effect on consolidating the ecological stability of the Ulungur River Basin.

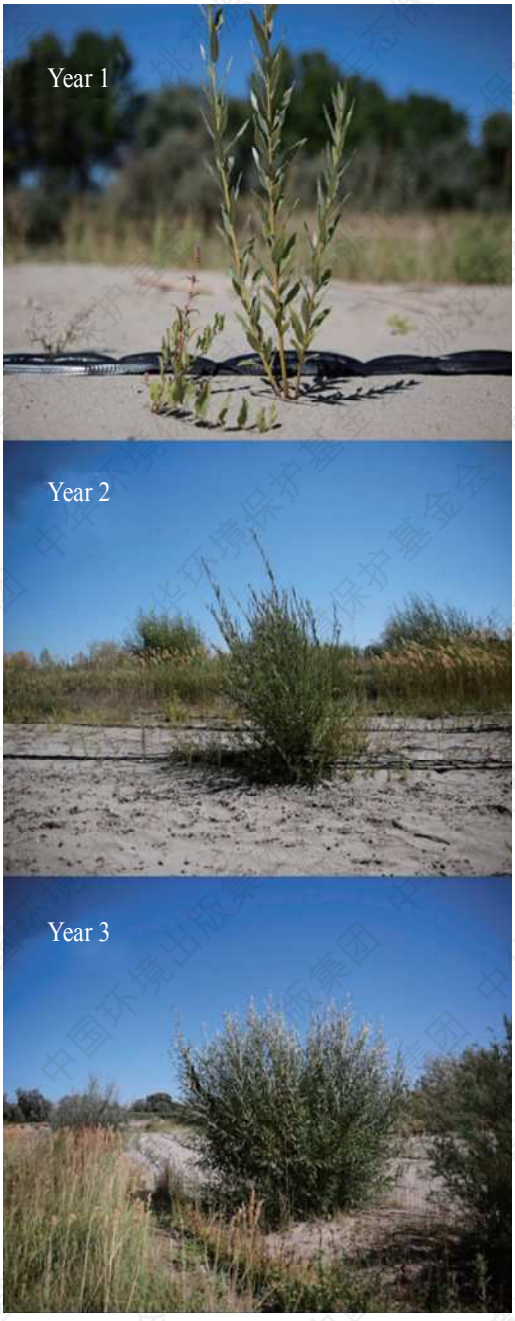
② The Beaver Canteen project has planted 420,000 shrub willows in the Ulungur River Basin, where has frequent floods, therefore playing a role in water and soil conservation through the developed root system.

③The Beaver Protection Series Projects have added nearly 30 beaver families, about 100 beavers, to the Ulungur River Basin in three years, and since the beaver is the national Class-Ⅰ key protected animal, its increase is of great significance for biodiversity conservation.

(2) Social-economic value

①A series of public welfare projects have posed great influences. In the past three years, the live streaming of the Beaver Canteen was shown on multiple media live streaming platforms with more than 40,000 online viewers a time. The three projects have been reported by more than a dozen media successively, with more than 200 million views on the Internet, which make the number of Altay NCA's self-media fans is nearly 2 million.

② Many nature protection volunteers have been trained and more people have been encouraged to participate in nature conservation. In the process of promoting these welfare projects, the Altay NCA is committed to attracting more attention to nature conservation and providing more people with opportunities to participate in nature



The growth of shrub willow in the Beaver Canteen(Year 1, Year 2 and Year 3)

conservation. At present, more than 200 online volunteers have been cultivated. 3 projects have received donation from 590,000 people, and the total number of live broadcast viewers of the beavers exceeded 10 million.

(3) Innovation

①To make the beavers more popular, this project takes a method of turning the beavers into a kind of "star" among wild animals, and turning fans and donors into the "owners" nominally of the beavers, which is a more acceptable way for young people.

②The mode of "adopting beaver" online. According to this project, mobilizing a herdsman to participate in the beaver protection requires about 500 RMB of forage. Altay NCA released the quota of forage purchases to netizens and installed infrared cameras near the beaver nests. The netizens who buy the forage can adopt a beaver online and watch the real-time video, recorded by the infrared cameras, of their adopted beavers. In this way, not only the economic pressure of Altay NCA is eased, but also the protection enthusiasm of more people is stimulated, so that better results are achieved.

③In this project, a standardized toolkit that can be copied nationwide was summarized. Altay NCA has formed a "Practical Toolkit for Nature Conservation and Wildlife Rescue" that can be applied to other social organizations and government departments in a standardized manner. It consists of initiation methods, implementation key points, publicity strategies, wild animal rescue treatment plans, breeding methods and other experience of the public welfare projects, which can assist other agencies to establish different wildlife protection systems and programs based on their own situations.

④The integrated development of the public welfare projects and the income of community residents are achieved. Altay NCA helped herdsmen increase their income by sharing the traffic of short videos taken at work and selling community farming and animal husbandry products at public welfare stores. Therefore, the balance of income and expenditure in the daily operation of Altay NCA is achieved. Altay NCA also explored a sustainable development model of nature conservation, specifically, in the early stages, fundraising online; in the middle stages, mobilizing community herdsmen to participate; and in the later stages, selling products online to benefit the herdsmen.

About the applicant: Nature Conservation Association of Altay Region was founded in September 2018. It is the only social organization with wildlife rescue qualifications in Altay, Xinjiang Uygur Autonomous Region. Its initiator is Chu Wenwen. The working philosophy of the Association is: connecting human society and nature, and promoting the harmonious coexistence of wild animals and humans outside the reserve. In 2019, the organization won the Ford Environmental Protection Award—Environmental Pioneer Award. In 2020, the "Beaver Canteen Project" of the Nature Conservation Association of Altay Region won the China Internet Public Welfare Summit—Vitality Recommendation and Commendation Project.

15

Establishment of a Wildlife Friendly Railroad Corridor for Open Plains Ungulates in Mongolia

Wildlife Conservation Society

Approach: In-situ conservation

Targets: Grassland; Mammals

Location: Along the Trans-Mongolian Railroad, Mongolia

Year of Implementation: 2020

Background

Mongolia is one of the few places in Asia where large unfragmented rangelands and mountainscapes exist and where important global populations of large terrestrial wildlife exist. It encompasses one of the largest contiguous temperate grasslands in existence and hosts an array of wildlife species that use large territories for their migration. WCS works with local communities, the Government of Mongolia, and the private sector to prevent biodiversity loss by ensuring connectivity between landscapes, leading efforts to develop sustainable management of living natural resources, and building capacity within government and local institutions to better manage Mongolia's wild heritage. These efforts will result in the preservation of intact landscapes, thriving populations of wildlife, and lead to improved livelihoods of local communities.

Main activities

The practice consists of retro-mitigation of existing safety corridor fencing along a railroad to allow highly mobile large and medium bodied ungulates [Asiatic wild ass(*Equus hemionus*), Mongolian gazelle(*Procapra gutturosa*), goitered gazelle(*Gazella subgutturosa*)] to move unimpeded across the Trans-Mongolian Railroad. This effort increases the permeability of the Gobi-Steppe Ecosystem, one of the largest grazing systems on the planet. Crossing locations are identified and segments of fence are removed entirely so that Asiatic wild ass can walk across or be reconfigured to

Khulan the Asiatic wild ass population the area

WCS Monitoring of Fence Free area

allow gazelles to crawl underneath.

The effort involves understanding the legal framework for safety considerations and obligations to protect ecosystems and species, outreach to pastoralists living in the vicinity of the railroad to raise their awareness and understanding of their obligations to keep livestock off the tracks, communicating with local and national government agencies to keep them abreast of project actions and successes, and engagement with railroad staff to help build ownership of the project and increase their capacity to understand the importance of habitat connectivity and their obligations to operate safely while adhering to environmental laws.

Once the fence is physically removed or redesigned, monitoring involves the use of automatic cameras to confirm wildlife use, tracking livestock with GPS technology to identify risk hotspots, preparing and disseminating outreach materials so that the general public is aware of and supportive of the efforts.

Main outcomes

(1) Ecological value

Habitat permeability in the Gobi-Steppe Ecosystem is critical for the survival of highly mobile species that depend on access to forage resources across vast spaces that have unpredictable distribution from one season to the next. A single barrier, in this case the Trans-Mongolian corridor fence, can have profound impacts. Asiatic wild ass once ranged across the entire Gobi-Steppe Ecosystem have disappeared from the eastern side of the fence and it is now the defining boundary of their range while each year thousands of Mongolian gazelles are entangled in the fence wires or struck by passing trains or turned away from their natural movement patterns. The creation of a wildlife-friendly fence corridor for these species increases their ability to move across the ecosystem allowing for khulan to repopulate their former range and allows gazelles to resume their long-distance movements across their range. This increases the integrity of the landscape and improves these species' outlooks for survival which provided important ecosystem services for subsistence hunting and economic benefit from wildlife-orientated tourism.

Areas with fences down

(2) Social-economic value

The region is occupied by nomadic pastoralists and their ability to move more freely across the landscape will be improved as well. Additionally, the removal of a long-standing barrier that is responsible for the death of thousands of animals and range reduction is a reason for pride in promoting good practices and ensuring landscapes and species are protected.

(3) Innovation

The practice involves creating a new safety corridor fence that has multiple designs built into it to ensure human safety is enhanced where needed, and this fece can limit the various movement of the species(the inability to jump over or crawl under a fence) .

About the applicant: WCS is a NGO founded in 1895 and has been devoted to global wildlife and nature conservation for over 100 years. This organization's first activity was at early 20th century where WSC successfully helped to restore the number of wild bison. Until today, WSC has taken conservation measures on many iconic wildlife worldwide.

16

Protection of Skywalker Hoolock Gibbons and Their Habitats

Cloud Mountain Biodiversity Conservation and Research Center

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making & implementation

Targets: Forest; Mammals

Location: Yingjiang County, Dehong Dai and Jingpo Autonomous Prefecture, Yunnan Province, China

Year of Implementation: 2017

Background

At present, only 4 species of gibbons totaling less than 1,500 are distributed in the wild of China, among which there are fewer than 150 Skywalker hoolock gibbons (*Hoolock tianxing*) . As a newly-named and critically endangered species, all the conservation activities are reliant on the baseline surveys and studies concerning this species. Half of the Skywalker hoolock gibbons in China are distributed in Yingjiang County, Dehong Dai and Jingpo Autonomous Prefecture, Yunnan Province at China-Myanmar border, and most of them live outside the reserve. Habitat fragmentation caused by human activities and infrastructure construction has impaired the reproduction of the Skywalker hoolock gibbon populations, and as

A Male Skywalker hoolock gibbon (Kyle Obermann/Photographer)

a result, some of the populations are now distributed in collective or private individual forests at lower altitudes. Such low-altitude habitats are of great significance to the protection of gibbons and the promotion of community participation in ecological protection to maintain the sustainability of ecosystem functions.

Main activities

The work of Cloud Mountain Biodiversity Conservation and Research Center of Dali Bai Autonomous Prefecture (hereinafter Cloud Mountain Conservation) in Yingjiang comprises three parts.

①Field survey and monitoring. Since 2017, Cloud Mountain Conservation has Nature Reserve to conduct in-depth surveys and population monitoring on the Skywalker hoolock gibbons in Yingjiang County, including information collection from witnesses, population surveillance survey, habitat quality investigation, dung collection for genetic diversity research, etc. Following years of continuous monitoring, the Cloud Mountain Conservation gets to know the population and distribution of the Skywalker hoolock gibbons in Yingjiang County, and has established a mechanism to exchange data with the local reserve, with population dynamics updated at any time. As a result, the Cloud Mountain Conservation has developed contacts with local government departments and communities of different levels, and promoted public awareness of gibbons through science popularization.

Field staffs are tracking and monitoring gibbons in the forest (Kyle Obermann/Photographer)

Yang Xun, a nature education project officer, is leading the children in the village to play nature experience games (Da Chui/Photographer)

②Promotion of community conservation.. The Cloud Mountain Conservation has learned about the status-quo and the real needs of local communities through in-depth interviews, and by referring to the data that local ecological surveys collect, the Cloud Mountain Conservation has identified, together with communities, the threat factors for habitat restoration in the area, and developed conservation plans with community participation for the threat factors. The Cloud Mountain Conservation carried out Participatory Rural Appraisal (PRA) surveys with the communities, shared what they have learned with the local villagers, and negotiated the gibbon conservation works that the communities can understand and operate with the community.

③Public scientific education for citizens. Community daily attention has been drawn to the natural environment and gibbon conservation through community youth nature education programs that provides closed-loop education on awareness, concept and action. Following the discussions with the Yingjiang County Bureau of Education and local schools, the Cloud Mountain Conservation has launched a natural science course on the gibbons based on the local natural environment, and has compiled a set of original textbooks, with trial class planned at local schools in Yingjiang County. For the children and teenagers in the village, the Cloud Mountain Conservation, having considered the community's traditional culture, organized nature experience activities, aiming to foster their understanding of the hometown environment and recognition of the value of nature conservation.

Main outcomes

(1) Ecological value

Years of wild survey and field research have provided scientific references for the conservation of this endangered primate. The Cloud Mountain Conservation has recorded the birth of 3 gibbons, 5 young gibbons leaving home, and the distribution of a new family in Yingjiang. The Cloud Mountain Conservation has proactively shared experience and data obtained over the years with other organizations, and provided sufficient and reliable information for the government to make protection decisions. *Project Plan on Skywalker Hoolock Gibbons Species Monitoring* was therefore developed by the Yunnan Tongbiguan Provincial Nature Reserve.

Yingjiang County is extremely rich in biodiversity. However, research and protection awareness on the species in the subtropical mid and low-altitude forest ecosystem represented by gibbons are lacking. The conservation of the gibbons and their habitats will lead to a more comprehensive and in-depth understanding of the biological resources and the functions of ecosystem services.

(2) Social-economic value

In 2019, the Cloud Mountain Conservation completed 271 in-depth interviews through one-on-one conversations and conducted programs of public space design and nature education to increase local recognition and dedication of the conservation. Meanwhile, patrol skills training was provided for government departments and nature reserves. Up to date, the Cloud Mountain Conservation has organized and guided pupils from the community elementary schools in 2 areas to take part in 7 hometown nature activities, involving a total of 322 participants.

Starting from 2019, the Cloud Mountain Conservation has teamed up with 10 zoos in cities like Beijing and Nanjing to carry out publicity activities on International Gibbon Day(October 24), with more than 50,000 people involved; more than 30 online and offline sharing sessions in over 10 cities have been held attracting at least 100,000 viewers.

(3) Innovation

The innovation is mainly reflected in the joint protection action that emphasizes the dominant role played by the community.

The gibbons of Yingjiang are mainly distributed in state-owned forests and collective forests in non-reserves. By means of preliminary community surveys and visits, the Cloud Mountain Conservation hopes to establish a community-based reserve in the gibbon habitat to make the community a dominant player in the conservation work, so that the inner drive could be tapped in the community to carry out ecological protection supported by the program. The Cloud Mountain Conservation has seen villagers bravely asking construction projects to take a detour in order to prevent damage to the habitat of the gibbons; the Cloud Mountain Conservation has also seen the creativity of rural children during education activities for nature experience, as well as the support from local government staff for such external conservation projects. Therefore, the Cloud Mountain Conservation has the confidence that through pilot community conservation practices, a model of “protecting traditional culture, promoting community management and the conservation of natural resources, generating sustainable economic sources, and making conservation and development go hand in hand” can be finally figured out.

About the applicant: Cloud Mountain Biodiversity Conservation and Research Center in Dali Bai Autonomous Prefecture is the only public welfare organization in China that focuses on the protection of gibbons and their represented forest ecosystems. It was co-founded by experienced mammal and bird research experts, conservation project managers, nature photographers, etc. The Cloud Mountain Conservation has persisted in field surveys monitoring and public education for six years, provided scientific basis and protection suggestions for the protection of gibbons to the relevant reserves, Forestry and Grassland Administration and other partners, and provided the public with a large number of high-quality activities and knowledge on the gibbons science popularization.

17

Hainan Gibbon Comprehensive Conservation Programme

Kadoorie Farm and Botanic Garden(Hong Kong), Beijing Representative Office

Approach: In-situ conservation; Publicity & advocacy; Policy-making & implementation; Technological innovation

Targets: Forest; Mammals

Location: Bawangling, the Hainan Tropical Rainforest National Park, China

Year of Implementation: 2003

Background

Hainan Gibbon(*Nomascus hainanus*) is endemic in the tropical island of Hainan Province and is listed as national class-I key protected animal of China. It is the rarest primate on the earth and is now confined to Hainan Bawangling National Nature Reserve(BNNR) . It was estimated that there were still more than 2,000 gibbons in Hainan in the 1950s, but due to rampant poaching and forest loss, the population sharply declined to less than 10 individuals in the 1970s. Although the establishment of Bawangling Nature Reserve in 1980 has saved the gibbon from the brink of extinction, yet the recovery process was slow, nearly stagnant for two decades.

In 2003, Kadoorie Farm and Botanic Garden(KFBG) was invited by the Forestry Department of Hainan Province to play an active role in saving the Hainan Gibbon. KFBG and BNNR launched the first simultaneous gibbon population survey followed by a conservation workshop to draft the first conservation action plan for the species. The survey confirmed the presence of only 13 gibbons in 2 groups in a small forest fragment in Bawangling, and identified the major threats to its survival as limited and fragmented habitat, degraded lowland forest, and serious human disturbances. Moreover, rubber was planted excessively as a cash crop, encroachment and the collection of NTFPs (Non-Timber Forest Products) were common in the nature reserve. The nature reserve had difficulty coping with these threats given their financial and technical limitations at the time. The conflicts between the reserve and

surrounding communities are getting worse.To save the Hainan gibbon, KFBG, together with the reserve, took a series of measures.

Main activities

(1) Intensive and persistent gibbon monitoring and conservation

To prevent poaching and to better understand Hainan Gibbon's ecology and population, KFBG has been supporting BNNR, financially and technically, to establish the Hainan Gibbon monitoring team for conducting routine monitoring since 2005. KEBF also organizes the annual simultaneous population survey since 2013 to better understand the dynamics of the remaining population.

(2) Habitat restoration and forest connectivity

To expand the available habitat for the gibbons, KFBG trained and supported BNNR to set up gibbon food tree nurseries using locally collected seeds. Consequently, over 80,000 fast-growing gibbon food trees of 51 native species have been planted in 150 hm^2 of degraded lowland habitat. KFBG and BNNR also installed artificial canopy bridge inside critical gibbon habitat to reconnect forest fragments created by landslides.

Community gibbon monitoring team established in 2010

(3)Community-engaged conservation

KFBG worked closely with BNNR to build trust with the local communities and promote permaculture in Qingsong Township, aiming to reduce human disturbance in gibbon habitats and enhance local livelihoods. Outreach activities were also conducted to raise conservation awareness. At Qingsong, a gibbon monitoring team comprised of Li and Miao ethnic groups were also set up to enhance patrolling of BNNR.

International Gibbon Day Fun Fair 2015

(4) Scientific studies support

KFBG had funded 6 research projects to study the ecology, population dynamics, potential habitat, habitat restoration, and conservation of Hainan Gibbon; the results from these studies help refine the conservation actions for the species.

With over a decade of determined effort and close collaboration, it is heartening to see the gibbon population has doubled to 35 individuals in 5 groups in 2021, and it is the only gibbon species that has a stable population trend, according to the latest IUCN Red List of Threatened Species Assessment.

Main outcomes

(1) Ecological value

As gibbon is widely recognized as a mammal effective in spreading seeds, effective protection of Hainan gibbons is of high value to the recovery and succession of tropical rainforest ecology in Hainan. This program has helped the Hainan gibbon population recover and expand, enabling its population to grow from 13 individuals in 2 groups in 2003, to 35 in 5 groups in 2021, marking a record-high number of individuals in decades. And its living area also expanded to forests where gibbons had not been seen for decades. Based on these conditions, the Hainan Gibbon will be able to further expand its population distribution range and make up for the ecological absence of gibbon in the ecosystem of Hainan Tropical Rainforest National Park for years. While protecting the gibbons, intensive patrols and community-based education and publicity also have significantly minimized human disturbance in BNNR, resulting in an umbrella effect that has contributed to the integrity of the Hainan tropical rainforest ecosystem, benefiting thousands of species that live in this area.

(2) Social-economic value

Hainan Gibbon is one of the typical flagship species for tropical rainforest ecosystem conservation in Hainan and had been on the list of *The World*'s *25 Most Endangered Primates* for five times. As the only endemic gibbon species in China, and a national class-I key protected animal of China, the Hainan gibbons together with the annual simultaneous survey them in October is widely covered by mainstream media. After the publication of the research report on the artificial canopy bridge constructed for the Hainan Gibbon, it was covered and reprinted by influential international media outlets, attracting more attention from the global community to the project. The positive results of Hainan Gibbon population recovery have also greatly encouraged global animal conservation workers, of which also made people in Hainan proud. The community atmosphere of caring for nature conservation came into being, which indirectly facilitated the establishment of Hainan Tropical Rainforest National Park. Meanwhile, KFBG and BNNR have trained a passionate community monitoring team, together with the education and publicity activities and promotion of permaculture over many years, which have all contributed to more supports from the surrounding communities towards nature conservation.

Hainan Gibbon using the artificial canopy bridge

(3) Innovation

There are countless examples of non-profit organizations carrying out species conservation projects in reserves and achieving good results. However, it is not so common to have a case like KFBG, which works closely with nature reserve and continues to invest in all aspects for nearly 20 years. This project successfully erect rope bridges for gibbons to connect fragmented habitats, which is also a rare achievement as an artificial corridor built for gibbons in the world.

About the applicant: Kadoorie Farm and Botanic Garden(KFBG) is a Hong Kong based environmental social organization. It has launched various nature conservation projects in China since 1998, including protection of natural ecosystems, conservation of endangered species, capacity building of local conservation personnel, raising conservation awareness in local communities. Since 2019, KFBG has officially registered as an overseas social organization in China, and currently have projects in Hainan, Yunnan, Guangdong, Beijing of China, and in Cambodia.

18

Naren Conservation Community

Wild Dali Nature Education and Research Center

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity; Traditional knowledge

Targets: Forest; Grassland; Farmland; Mountain; Arid and semi-arid area

Location: Deqin County, Diqing Tibetan Autonomous Prefecture, Yunnan Province, China

Year of Implementation: 1998

Background

Naren situates on the largest plain of Deqing County, and villagers live harmoniously with nature by a way semi-agricultural and semi-pastoral

Naren community is located in Maoding Village, Yangla Township, Deqin County, Diqing Tibetan Autonomous Prefecture, Yunnan Province, at the junction of Yunnan, Sichuan Provinces and Tibet Autonomous Region. For quite a long time, it has been a deeply impoverished area with inconvenient transportation and poor supplies of materials. Naren accommodates 40 households of nearly 300 people, all of whom are Kangba Tibetans. Naren enjoys fairly rich natural resources and biodiversity. Also, standing outside the northern boundary of the Baima Snowy Mountain Reserve, Naren is home to a large population of Yunnan snub-nosed monkeys.

In December 1998, Naren held a village congress, where the villagers began to have a

rough picture of the state-issued environmental protection laws. They were asked to understand and abide by the laws to cease deforestation and protect the environment. At the same time, village rules and regulations were drafted, and articles were specially set in rules and regulations to protect the ecosystems and the forests, which marked the formal establishment of Naren Conservation Community, with all villagers as the mainstay. Since then, the Naren has started spontaneous protection practices for more than 20 years.

Main activities

Since 1998, all villagers have vowed not to hunt, and unanimously protect the forest strictly. Trees that had been cut down were replanted and restored into forests; and the shotguns were handed in, the hunting dogs were tied up, and the wire traps were recycled from the forest. Naren's environmental protection awareness and its practice also intimidate neighboring villages, preventing their entry into Naren for poaching and illegal logging.

Naren Conservation Community relies on village autonomy and spontaneous protection. Village rules and regulations played a critical role. The villagers believe in Tibetan Buddhism's concepts of equality of all beings. Meanwhile, the villagers also embrace scientific guidance. They do acknowledge the importance of environmental protection through village governance, science, religion, rules, and regulations. Moreover, they can transform environmental protection awareness into actions, hence reinforcing behavioral constraints from multiple perspectives. Villagers, whose duties and rights align, whose aspirations and actions align, are the best guardians of nature while regarding themselves as the ones that enjoy the benefits of environmental protection. By protecting nature, they can get the gifts from nature. Learning from the outside world while maintaining the spirit of unity and mutual assistance, the villagers make the sustainable development a reality, which is in accordance with the Naren's philosophy: respecting nature and nature will secure your livelihoods. It is planned that in the future, the village will embrace environment-friendly industries, such as mountain medicine cultivation and eco-tourism, to improve the living standards of villagers and attract young people to return to the village.

Since 2019, with experts' guidance, Naren villagers have been actively learning to fill out record forms, identify animal and plant species, and use tools such as infrared cameras, GPS, and electronic maps. The Naren villagers combines the original traditional knowledge and simple protection actions with modern scientific research methods. Therefore, the capacity for forest protection is constantly being improved, and unique integrated protection methods are being explored, so that a long-term scientific research base for all disciplines is expected to be built.

Main outcomes

(1) Ecological value

①Naren accommodates a variety of land forms and ecosystems, including snow-capped mountains,

July 2020, a college student is showing wildlife photos from camera traps to primary school students

alpine shoals, primeval forests, alpine meadows, bushes and lakes, and the dry-hot valley along the Jinsha River all in the vertical range of 2,100-5,200 m above the sea level. Naren has the largest dam in Deqin County and the largest primeval forest in Deqin County. The long-term nature production of Naren makes the relationship between human beings and nature closer and the service function of the ecosystems sounder.

②The mountain forests around Naren are the habitat of Yunnan snub-nosed monkeys in Wuyapuya population. Thanks to the efforts of the villagers, the living environment of the Yunnan snub-nosed monkeys remains stable and the number of the species keeps increasing. The number of Wuyapuya population has steadily increased from more than 175 confirmed in 1996 to at least 450, according to the latest survey, accounting for about 13% of the total number of the Yunnan snub-nosed monkeys.

(2) Social-economic value

As the base for the protection network of the Yunnan snub-nosed monkeys, Naren has greatly helped Baimaxueshan National Nature Reserve conduct many conservation projects in the past 20 years. Also, it has cooperated with a number of researchers and NGOs, such as the Kunming Institute of Zoology (KIZ). Widely recognized by the outside world, Naren has been included in the List of China's Land-Trust Nature Reserve. The forest rangers of the village have won many awards, and the village has been featured in *National Geographic* of the United States, German and French documentaries, CCTV variety shows, and the promotional materials of the UNEP.

(3) Innovation

①Autonomy and foresight. The leaders of Naren have foresight, understand the national policies and regulations, and more importantly have a clear picture of the village's conditions and

characteristics. They therefore lead the whole village to take action. Their eyes are not fixated only on the short-term interests. They emphasize fairness and the hard-working spirit of the whole village. With sensible governance, the village has chosen to live with the mountains, banned harmful activities, such as logging and hunting. Moreover, more than 20 years of conservation activities were carried out by all the villagers themselves without relying on external funding.

②Self-motivated model. In the current reserve system of China, the government has always been the administrator and executor, and the villagers are often the object of management. However, in the community reserve, the villagers are the main body of conservation.. They are self-restraint both in work and life. In this way, development is achieved on the basis of environmental protection. Multiple parties share the same interests, and hence make joint efforts towards environmental protection. This model avoids the clash between national conservation and villager's development, reduces the financial and administrative burden of the state, gives full play to the ecological wisdom of the villagers living in nature for generations, respects local culture and governance; and it is therefore a spontaneous, fair and sustainable national conservation model.

A group photo of Naren villagers

About the applicant: Wild Dali Nature Education and Research Center is a non-profit organization dedicates to spreading and promoting the concept of nature conservation through videos. By photographing the wildlife and natural environment in China, it strives to realize the belief of "protecting nature with images".

19

Exploration and Practice of the Siberian Crane Protection in Poyang Lake

International Crane Foundation

Jiangxi Poyang Lake National Nature Reserve

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Sustainable use of biodiversity

Targets: Freshwater and wetland; Avifauna

Location: Poyang Lake National Nature Reserve,Jiangxi Province, China

Year of Implementation: 1983

Background

The Siberian crane(*Leucogeranus leucogeranus*) is a critically endangered species in the *IUCN Red List of Threatened Species*. It is a national class-Ⅰ key protected wild animal, with a global population of 3,600-4,000. Currently, the central and western populations wintering in India and Iran are almost extinct, and only the eastern populations wintering in Poyang Lake remain.

A large group of Siberian cranes in Poyang Lake

The International Crane Foundation (ICF) is an international non-governmental organization that focuses on the protection of all 15 crane species and their habitats. To be clear about the survival status of the eastern Siberian crane population, ICF has cooperated with Chinese scientists since 1979. With the efforts of the scientists, more than 100

Siberian cranes were finally found in Poyang Lake in the winter of 1980 for the first time, and that's when unremitting research and protection of this species began. On the advice of ICF and domestic experts, Jiangxi Provincial Government established the Jiangxi Poyang Lake Migratory Bird Reserve in 1983 with the protection of the Siberian cranes as the primary goal. The Reserve was upgraded to a national reserve in 1988, with its name changed to Jiangxi Poyang Lake National Nature Reserve(hereinafter referred to as "Poyang Lake Reserve") .

Main activities

① In 1998, the Yangtze River flood posed severe impact on the Poyang Lake wetland ecosystem. The Siberian cranes were facing a severe problem of food shortage, and their living conditions were worrying. In order to learn the population quantity and distribution of the Siberian cranes and other cranes to guide effective protection, with the support of the Forestry Department of Jiangxi Province, ICF and Poyang Lake Reserve jointly launched the Poyang Lake Crane and Wetland Ecological Monitoring Project in 1999 which has been continued till now. The accumulated monitoring data have provided a decision-making basis for the conservation of Poyang Lake wetland and waterbirds such as the Siberian cranes. To improve the wintering habitat of the Siberian cranes, in 2014, based on years of monitoring data, the two parties formulated and implemented a water resource management plan for the shallow-lakes in the core area of the Reserve. Meanwhile, pilot waterbirds habitat management has also been carried out in other the shallow-lakes in the Reserve.

Experience exchange of Siberian cranes in Poyang Lake

2019 Poyang Lake International Bird Watching Week

② The protection of cranes requires not only policy support from the government, but also understanding and support from the public, especially the local communities. Therefore, since 2003, the two parties have carried out effective work in public and community environmental education, including the development of local teaching materials, the design and production of a large number of publicity materials such as manuals, annual calendars and wall calendars with the cranes and wetlands as the theme. Public advocacy and community publicity are carried out regularly, "Bring Environmental Education into the Classroom" activities are launched in local schools, which significantly improves the awareness of local communities, especially young people, on the protection of the cranes and their habitats, and cultivates the sentiment of understanding and love of their hometown.

③ Through nearly 30 years of strategic cooperation between the ICF and the Poyang Lake Reserve, by giving play to the advantages a social organization and the Reserve, the protection of the Siberian cranes has gradually received attention and support from more and more stakeholders. The population of the Siberian cranes grew from over 100 in the 1980s to 2,900～3,000 in the 1990s, and now it remains stable at 3,600～4,000.

Main outcomes

(1) Ecological value

The Siberian crane is the flagship species in the wetland. This project not only maintains the steady growth of the eastern population of this species, but also promotes the protection of the wetland ecosystem and biodiversity in the Poyang Lake Basin. The Poyang Lake wetland provides not only a haven for more than 500,000 migratory birds wintering here every year, but also suitable habitats for other species such as finless porpoise(*Neophocaena asiaeorientalis*) and water deer(*Hydropotes inermis*) . Poyang Lake is the most important habitat on the East Asian-Australasian waterbirds

migration route. It has an irreplaceable position in the world. The protection of the Poyang Lake wetland ecosystem is of great significance.

(2) Social-economic value

The protection of the Siberian cranes in Poyang Lake has not only drawn more attention to the Siberian cranes from the whole society, but also promoted the protection of Poyang Lake.

①The Siberian crane was designated as the provincial bird of Jiangxi Province in 2019. To promote the protection of the Siberian crane and ecosystem of Poyang Lake, Jiangxi Provincial Government hosts the Poyang Lake International Bird Watching Week every two years to practice ecological protection and environment-friendly development.

②The integrity of the Poyang Lake waterbirds protection network was promoted. The Poyang Lake Reserve has established 11 protection and management stations in the lake area. Another 1 national, 2 provincial and 10 county-level reserves have been established successively.

③Long-term ecological monitoring and research on Poyang Lake have provided both strong data support for the demonstration of major projects related to Poyang Lake, and basic data for scientific research institutions and universities at home and abroad in researching cranes and wetland ecosystems. Many doctoral students and more than ten master students have been supported.

④The long-term cooperation between ICF and the Poyang Lake Reserve has improved the monitoring system of the Reserve, and strengthened its protection and management capabilities.

(3) Innovation

Protection of the Siberian crane in Poyang Lake adheres to the principles of scientific planning, government leadership, and multi-party participation. Innovation has been made in many aspects. ①The Reserve, with the assistance of ICF, has formulated monitoring procedures, and has become becoming one of the few reserves in China that carry out long-term ecological monitoring. ②A dedicated database management system has been developed and updated for a plurality of times. It has been in use for nearly 20 years, achieving effective data storage and rapid data extraction.

About the applicant: International Crane Foundation(ICF) was founded in 1973. It is a non-profit organization that studies and protects cranes. It protects the cranes and their habitats in more than 50 countries around the world in a variety of ways.Poyang Lake National Nature Reserve was founded in 1983 and is affiliated to the Jiangxi Provincial Department of Forestry. Its main functions are to protect the rare migratory birds represented by the Siberian crane in Poyang Lake, and to promote the ecological environment of wetlands, to carry out scientific research related to ecological protection, to scientifically use natural resources in the sustainable manner, and at the same time to supervise the Yangtze finless porpoise and other species and the ecological environment of their habitats within the scope of Yangtze finless porpoise reserve.

20

All Stakeholders' Participation in Building a Big Black-necked Crane Conservation Network

Kunming Institute of Zoology, Chinese Academy of Sciences

Ecology and Nature Conservation Institute, Chinese Academy of Forestry

International Crane Foundation

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making and implementation; Technological innovation; Access and benefit-sharing of genetic resources; Traditional knowledge

Targets: Freshwater and Wetland; Avifauna; Germplasm resource conservation

Location: Qinghai-Tibet Plateau and its surrounding areas

Year of Implementation: 2004

Background

The black-necked crane(*Grus nigricollis*) is the only crane that lives on the plateau among the world's 15 crane species. It is distributed on the Qinghai-Tibet Plateau and its surrounding areas, involving China, India and Bhutan. It is the flagship species of wetlands on the Qinghai-Tibet Plateau. The black-necked crane is the last discovered and least studied crane species due to factors such as remote distribution, traffic limits, and complex environment.

Main activities

From 2004 to 2006, the Kunming Institute of Zoology(KIZ), Chinese Academy of Sciences, the National Bird Ring Logging Center under the Research Institute of Forest Ecology, Environment and Protection(RIFEEP), Chinese Academy of Forestry and the International Crane Foundation(ICF) jointly carried out the first satellite tracking study of black-necked cranes in China, which revealed the important habitat and migration routes of the black-necked cranes, and researched its ecology and protection. Years of practice have made 3 researchers Yang Xiaojun, Qian Fawen and Li Fengshan

from the above mentioned three institutes realized that effective protection of the black-necked cranes requires the joint participation of concerned institutions, organizations and stakeholders in breeding grounds, migratory route stops, and wintering places. They jointly initiated the "Black-necked Crane Conservation Network"in 2011, established an annual meeting and core group communication and coordination mechanism, and jointly promoted the information communication and experience sharing among protection participants, government authorities, research institutions, NGOs, and volunteer groups engaged in black-necked crane conservation and research, and worked together in scientific research, simultaneous investigation and coordination of joint protection actions.

Portrait of a wintering black-necked crane

The network keeps growing and developing over the past 10 years.. There are now 68 research institutions and conservation units from China, India, Bhutan, the United States and other countries，continuously carrying out activities like scientific research and monitoring, in-situ conservation, popularization of science, environmental education and international exchanges regarding the black-necked crane.

Main outcomes

(1) Ecological value

The black-necked cranes live on plateaus throughout their lives. The distribution area covers most of the western plateau of China, highly overlapping with the wilderness and typical plateau ecosystem reserve in China, and the ecological environment is extremely fragile. The building of the conservation network has not only made the black-necked cranes' population increase significantly, but also promoted a significant increase in the area of black-necked crane conservation. At present, there are 27 types of wetland reserves with black-necked cranes as the main object of protection, including 13 national and 14 provincial nature reserves, with a total area of over 255,000 km^2. The black-necked crane is a flagship species of the wetland ecosystem of the Qinghai-Tibet Plateau, the construction of the black-necked crane reserve system as well as the protection and restoration of the habitat also benefit a variety of species living in the wetland of the plateau, and improve the effectiveness of

Wintering black-necked crane population in Yajiang Valley

biodiversity conservation in the "Third Pole" region of the Qinghai-Tibet Plateau.

According to the results of a national simultaneous survey of wintering cranes organized by the Crane Joint Conversion Committee, China Wildlife Conservation Association in January 2020, China now has a wintering black-necked crane population of over 16,000, which is a nearly three-fold increase compared with 15 years ago. In July 2020, the IUCN removed the black-necked crane from the list of Threatened Species and downgraded it from "Vulnerable (VU)" to "Near Threatened (NT)".

(2) Social-economic value

The black-necked crane conservation network integrates all stakeholders in the protection of the black-necked cranes, leverages their own resource advantages, and realizes comprehensive and effective protection of the black-necked cranes through efficient communication, collaboration and talent training. After the establishment of the network, the number of research papers have increased dramatically, and the network has trained many researchers as well as conservation managers and

volunteers engaged in the research and protection of the black-necked cranes. The conservation network has also greatly stimulated the enthusiasm of conservation management departments, and the staff fore, actively applies for projects, carries out investigations and studies, protects and restores habitats, and formulates management methods or work regulations. Through environmental education, capacity building and international exchanges, the social organizations have enhanced the protection awareness and capabilities of the public and communities, facilitated and promoted experience sharing among domestic and foreign participants, and told the Chinese story of wildlife protection to the international community. At present, the network has been developed into an information exchange and learning platform for global black-necked crane researchers and protection workers.

(3) Innovation

The protection of migratory species is inseparable from the effective work and active cooperation in relevant areas, including the breeding grounds, the migratory route stops and the wintering places. The absence of any link will affect the survival and reproduction of the species. The conservation network focuses on the black-necked cranes and attracts all domestic and foreign researchers and conservation workers who are concerned about this species. In an open, equal and flexible way, it builds a platform for real-time sharing of information, exchange of experience, coordination and cooperation among scientific research workers, in-situ conservation authorities, administrative authorities, NGOs and volunteers, and all stakeholders are encouraged to actively participate in it. The annual meeting mechanism has effectively improved the expertise of the member units and the cohesion of the network. This organizational model avoids the lack or delay of information in the research and protection of migratory birds that often leads to difficult situations where protection work is not systematic or scientific enough. It also establishes a basis for cooperative investigation, joint research and coordinated protection.

About the applicant: Kunming Institute of Zoology, Chinese Academy of Sciences is a comprehensive research institution in the field of biodiversity evolution, protection and sustainable use in China. It mainly conducts research on the evolution, protection and utilization of biodiversity. Ecology, and Nature Conservation Institute, Chinese Academy of Forestry, the subordinate National Bird Ring Logging Center, is affiliated with the Bird Ring Logging and Migration Research Group of the Institute, and is mainly engaged in bird migration and endangered bird conservation biology research.International Crane Foundation is a non-profit organization that studies and protects cranes in the world. It protects the cranes and their habitats in more than 50 countries around the world in a variety of ways.

21

Restoring Peatlands: Rewetting of Heath and Forest Moors

BUND Bundesverband(German Association)

Approaches: In-situ conservation; Public participation; Technological innovation;Sustainable use of biodiversity; Traditional knowledge

Targets: Forest; Grassland; Urban; Freshwater and wetland; Mountain; Flora; Amphibians; Avifauna

Location: Germany

Year of Implementation: 2019

Background

The project area is a region near the Rhine River in Germany. Originally the area had many wet habitats, including peatland. However, these habitats were drained, mostly for forestry. Today, the area is densely populated and largely overbuilt with infrastructure such as cities and roads. Nevertheless, it offers a refuge for many species. the BUND Bundesverband (German Association) (hereinafter,BUND)'s survey show that nature conservation action is urgently needed.

Fresh peat

Main activities

BUND collected data on the soils, plants and draining structures, and searched for habitats that could be restored by rewetting. The results show that 69 habitats need urgent rewetting, covering approximately 500 hm^2. Following the classification systems of the European Union and the local

area, the habitats are wet or moist ecosystems which include bog, fen and marsh—all of which are rare and endangered in the region.

Rewetting will lead to the restoration of different types of habitats, which will have a very positive impact on biodiversity conservation. Moreover, the rewetting of peatland soils is one of the most effective and cost-efficient climate change mitigation measures with a high reduction potential of CO_2 equivalents. Therefore, the following project is planned to realize habitat restoration with all its accompanying positive effects on climate and biodiversity.

Main outcomes

(1) Ecological value

The restoration of peatland habitats is one of the "Nature-based Solutions" to combat species extinction and the climate crisis at the same time. It is also a suitable measure for adapting to the negative consequences of climate change.

Ecosystem services provided by peatland: Habitat for rare flora and fauna: as peatland habitats become endangered, so do their highly specialized species. These can only be protected by preserving their habitats. The Heideterrasse offers refuges for more than 700 animal and plant species on the local species red list and at least 37 species of special responsibility in Germany.

Landscape water balance: Peatland habitats store water and can act as a floodplain(for water retention). In the project areas, precipitation water is often discharged via artificial drainage ditches. The deconstruction of these drainage structures (rewetting) increases the local water absorption and strengthens the area's buffer function. This reduces the effects of heavy rain, floods and droughts.

Research Team in the Field(left P. Brenner, right Dr. M. Grund)

Peat moss(*Sphagnum* sp.) with bog beacon(*Mitrula paludosa*)

Filtering function: peatlands improve water quality.

Climate protection: With regard to climate change, the restoration of peatland habitats has a positive effect for three reasons. Intact peatlands act as carbon sinks. They sequester CO_2 from the atmosphere and store carbon permanently in the soil in the form of peat. In drained peatlands, on the other hand, the peat is mineralized and CO_2 is released. Thus, peatlands go from being a reservoir to a source of greenhouse gases and contribute to climate change. Restoring peatlands allows habitats become more resistant to the negative effects of climate change.

(2) Socio-economic value

The rewetting of peatlands shall be carried out by local people under guidance of BUND scientists. This allows local people to learn about their natural environment and develop an appreciation for it. If they are encouraged, local people can be the best defenders of habitats and their diversity.

Due to their special biology as transitions between water and land habitats, peatlands with their special flora and fauna offer excellent opportunities for environmental education. The aspects of species protection and climate protection are highly topical and meet with great interest, especially from the younger generation.

(3) Innovation

A peatland restoration project of this scale has never been tried before in the Rhine-Ruhr conurbation.

About the applicant: BUND(Bund für Umwelt und Naturschutz Deutschland), based in Berlin, is federally organized: in each federal state, a BUND regional association is committed to nature conservation and environmental protection.

22

Lower Wuyuan River Bee-eater Reserve in Haikou

Haikou Duotan Wetland Research Institute

Approaches: In-situ conservation; Public participation; Financial support mechanisms; Sustainable use of biodiversity

Targets: Urban; Freshwater and wetland; Avifauna

Location: Wuyuan River Wetland in Haikou, Hainan Province, China

Year of Implementation: 2019

Background

The west coast of Haikou in Hainan Province has traditionally been a breeding place for the blue-tailed bee-eaters(*Merops philippinus*) and blue-throated bee-eaters(*Merops viridis*) . These two bird species belong to the bee-eater family Meropidae. They breed in South China in summer and fly to Southeast Asia in winter, and are uncommon resident birds or summer migratory birds on the Hainan Island. Both species have been upgraded to national class-Ⅱ key protected wildlife according to the List of Key Protected Wild Animals in China released in 2021. Because of their pleasing appearance and interesting habits, the bee-eaters are highly popular among birdwatchers and bird photographers, known as “the most beautiful small birds in China”.

The bee-eaters prefer to nest in sand walls in lower reaches of rivers or coastal areas, which are also areas with high human activity intensity. They can tolerate a certain amount of human interference and survive in urban areas. Many cities with breeding records of the bee-eaters have the potential and value for ecological restoration and development of urban reserves. Furthermore, the bee-eater, as a flagship species with strong public appeal and attractiveness, is suitable for promotion. It can not only enable the local habitats to be better protected, but also protect the less influential species.

More than 20 bee-eaters were found nesting and breeding next to the Wuyuan River National Wetland Park in 2018, which makes this place the closest known breeding site for the bee-eaters to the

Blue-tailed bee-eaters and their nests

Overall view of Bee-eater Reserve

city. In April of the following year, the Haikou Municipal Government established the Lower Wuyuan River Bee-eater Reserve, covering an area of about 8.39 hm^2.

Main activities

① The Haikou Duotan Wetland Research Institute, Haikou Wetland Conservation Management Center and Haikou Xiuying District Wetland Conservation Management Center worked together and created a small-scale habitat for the bee-eaters in the Reserve: building a sandy slope for the bee-eaters to nest, clearing weeds on the slope, planting nectar plants to attract insects that the bee-eaters like to feed on, and digging ditches to construct artificial wetlands. Bird watching shelters have also been built to facilitate the observation of the bee-eaters under the premise of reducing the impact of human activities on their breeding.

② Since 2019, bee-eater habitats have been constructed for three years, and bee-eater conservation has been actively carried out. The habitat construction had an immediate effect and soon attracted more bee-eaters to come here to breed, with a maximum of 56, 58 and 72 bee-eaters recorded from 2019 to 2021 respectively. Since May 2021, this area has become the most populous breeding cluster of bee-eaters in Haikou.

③ The Bee-eater Reserve is the most popular nature education spot at the Wuyuan River Wetland Education Center in Haikou, having held more than 20 propaganda and education activities. The "Goodbye Bee-eater" theme activity in July 2020 and the "Hello Bee-eater" thematic publicity activity on International Biodiversity Day in May 2021, both were participated by multiple parties and attracted nearly 600 residents. Through activities such as visiting the bee-eater habitats and learning about their habits, a sound social impact was created.The bee-eater has become one of the beautiful "ecological icons" of Haikou, attracting photographers from all over the country. In 2019, the First Bee-eater Photography Competition collected more than 500 photos of the bee-eaters. The second competition continued the following year and received a good response from society.

Main outcomes

Habitat construction

(1) Ecological value

This case study preserves the urban coastal sandy habitat by means of ecological remediation and habitat construction, providing space for the blue-tailed bee-eaters and the blue-throated bee-eaters to habitat and breed. In addition, the Wuyuan River National Wetland Park nurtures a diverse range of habitats including mangroves, grasslands, rivers and shallow sea, thus providing shelter and habitat for many wild animals. In addition to the "star bird", i.e., the bee-eaters, you can also find the national class-Ⅱ key protected bird species such as the red junglefowl (*Gallus gallus*), the greater coucal (*Centropus sinensis*), and the white-throated kingfisher(*Halcyon smyrnensis*) .

(2) Social-economic value

The bee-eater conservation in the lower Wuyuan River has been reported by the provincial and municipal media, and has become a bright spot in the construction of Haikou as an international wetland city. The continuous nature education held here has stimulated citizens' awareness of biodiversity conservation, and good social effects have been achieved.

(3) Innovation

The Lower Wuyuan River Bee-eater Reserve in Haikou is the first reserve in Hainan established and managed jointly by the government, social organizations and volunteers. It is also Hainan's first bird breeding reserve inside thecity. By taking its geographical advantage of being close to the city center, this project proactively explores the rational use of urban wetlands, gives full play to the social service function of the reserve, adheres to a management model of "government leadership, multi-party governance, and public supervision", and provides a place for public recreation, wetland nature education and ecological civilization education.

About the applicant: Haikou Duotan Wetland Research Institute is a private non-enterprise unit registered with Haikou Civil Affairs Bureau. Its purpose is to guide the effective management of wetlands through scientific research, and to promote the protection and sustainable use of the wetlands. Its business scope includes investigation, planning, monitoring, science popularization, management training, etc.

23

Ecological Restoration of Habitats for Migratory Birds in South Yellow Sea

Academy of Environmental Planning & Design Co., Ltd., Nanjing University

Approach: In-situ conservation

Targets: Ocean and coastal ecosystem; Avifauna

Location: Yancheng National Rare Bird Nature Reserve, Rare Birds, Jiangsu Province, China

Year of Implementation: 2014

Background

The South Yellow Sea Wetland is the key habitat for five types of migratory waterbirds represented by cranes, shorebirds, wildfowl, herons and gulls along the "East Asia-Australia Flyway" international migratory birds migration routes. Besides, habitats such as estuary mudflats, salt ponds and reservoirs are of great significance for wetland conservation and migratory birds protection.

Since 2014, Academy of Environmental Planning & Design Co., Ltd., Nanjing University (hereinafter ,Nanjing University Environmental Planning) have conducted a series of studies on the current situation of rare birds in Jiangsu Yancheng Wetland Rare Birds National Nature Reserve together with Jiangsu Friends of Green Environment(Nanjing Dadi Cultural Development Exchange Center). It was found that the high-quality habitats of wetland waterbirds represented by red-crowned cranes (*Grus japonensis*) obviously decreased due to the human factors such as climate changes, invasion of smooth cordgrass (*Spartina alterniflora*), and the storage of water in the salt field reservoirs in winter; and furthermore, the expansion of deep-water cultivation ponds has caused the decline in the carrying capacity of this region for most wetland waterbirds represented by the red-crowned cranes.

Main activities

In order to restore the habitats of wetland waterbirds represented by red-crowned cranes, Nanjing University Environmental Planning has discussed with Jiangsu Friends of Green Environment and the

Reserve for many times with plenty of demonstrations. Finally, a project of "stopping cultivation and recovering wetlands" as well as the wetland habitat restoration and construction with multiple purposes based on the ecological needs of different kinds of birds were carried out in two aquaculture ponds in Guandong Salt Field, Xiangshui County, Yancheng Municipality, the representative region of Rare Birds Reserve.

Red-crowned cranes choose to winter in the restoration area

Two ecological restoration areas of the Guandong Salt Field are designed according to the ecological habits of wetland waterbirds represented by the red-crown cranes, with a total area of 3,000 mu and 342.2 mu respectively. Each of the two areas involves five main functional areas: a shoal area, a shallow water area, a deep-water area, an ecological island and an ecological isolation area. The reconstruction and restoration of the original natural wetland ecosystems, simulated in the restoration areas, in the South Yellow Sea could be guaranteed by regular water retreat and moderate proliferation and release. Self-circulation of energy and materials can be realized in a way of regular water change(mainly by ebb and flow, supplemented with mechanical water change by pumps if necessary) in the region without too much manual intervention. The shoal area in the region is mainly used for the red-crowned cranes and other wading birds as well as swimming birds to inhabit; the shallow water area has a depth of 10~30 cm, which is mainly used for the wading birds such as the red-crown cranes to feed themselves; the deep water area has a depth of about 2 m, which provides a breeding and safety area for released fish, so that a stable food source is guaranteed for the waterbirds in the restoration area; the earthwork of the ecological island comes from soil balance after digging deep in the deep water area. By growing the pioneer plant *Suaeda glauca*, the island can be used as an important breeding place for the gulls and terns; and the ecological isolation area, situated at the boundary of the restoration area, consists of ditches and tall walls of giant reed (*Arundo donax*), thus having a function of preventing human interference.

Main outcomes

(1) Ecological value

After the establishment of the two ecological restoration areas in the Guandong Salt Field, firstly, the habitats for various kinds of waterbirds have been constructed, which serve as the habitats for the red-crown crane and other waterbirds in winter, the concentrated breeding grounds for the gulls and the terns as well as the high-tide habitats for the shorebirds in Yellow Sea Wetland. During the breeding season, the ecological island in the restoration area has provided shelters for nearly 4,000 pairs of breeding terns and a few

The restoration area is also a high-tide habitat for shorebirds [the photo shows a group of dunlins (*Calidris alpina*)]

A corner of tern breeding area on the ecological island

shorebirds. The habitats also attract rare and endangered birds such as the oriental white storks (*Ciconia boyciana*), Eurasian spoonbill (*Platalea leucorodia)* and ospreys (*Pandion haliaetus*) . In total, 2 species of national class-Ⅰ protected birds, 8 species of national class-Ⅱ protected birds, and 11 species of birds of near-threatened and above level listed by IUCN have been observed. Secondly, the growth of smooth cordgrass, an invasive species, in the implementation area has been successfully controlled, and the original Suaeda land has been restored; and thirdly, a stable ecosystem with self-circulation has been developed. And the deep-water intensive ponds with serious human disturbance have been restored to coastal wetlands close to nature to the maximum.

The ecological effect of the migratory birds'selecting the ecological restoration areas in the Guandong Salt Field as the concentrated habitat has been obvious. The populations of plankton, benthos, aquatic creatures, terrestrial vegetation and birds have reached dynamic equilibrium basically. A total of 68 kinds of waterbirds have been monitored, which greatly contribute to improving the carrying capacity of birds in the Yellow Sea Wetland and expanding the migratory bird populations along the "East Asia-Australian Flyway".

(2) Social-economic value

During the process of project implementation and post-monitoring, Nanjing University Environmental Planning focuses on both the ecological governance effect in the restoration areas, and the duty of raising the awareness of nature conservation among surrounding farmers. It integrates the effect of ecological restoration with multimedia publicity, mobilizing the surrounding enterprises,

public institutions, farmers and growers to participate in bird protection; and by assisting the surrounding farmers to establish ecological breeding brands, farmers' economic interests are guaranteed, so that the concept of ecological breeding and relevant technical points are popularized, and the harmonious coexistence between human beings and nature is further enhanced.

(3) Innovation

Facing difficulties such as strong invasiveness of smooth cordgrass, regional serious human disturbance, and poor water system connectivity, this project adheres to the goal-oriented and ecological principles, and forms innovative experience with coastal characteristics:

①The multipurpose model of water level control and topographic reconstruction. Based on the fragmented aquaculture pond landscape, different habitats like shoal, deepwater pool and island were built to realize the seasonal dynamic management of waterbirds habitats in different habitats. It makes up for the deficiency of the natural ecosystem. By means of water-level management, birds with different ecological niches can utilize the same habitat in different seasons, which significantly improves the effect of ecological restoration.

②The model of operating and maintaining wetland ecological system with low intervention. Build a tidal semi-open water system, establish a comprehensive regulation and management model for hydrology and vegetation coverage, form a stable high-tide waterbirds habitat, and achieve self-maintenance and balance of the food web in the restoration areas through the natural tides and the construction of aquatic communities.

The matching model of pioneer vegetation in the coastal wetland restoration. This project has summarized a set of pioneer vegetation matching models suitable for the Yellow Sea tidal flat wetland, and quickly established the restored wetland vegetation community. Besides, it has prevented the second invasion of the smooth cordgrass by natural methods.

About the applicant: Academy of Environmental Planning & Design Co., Ltd., Nanjing University is a state-owned eco-environmental protection consulting enterprise directly affiliated to Nanjing University, one of the "double first-class" universities in China. It carries out coastal biodiversity monitoring, wetland ecosystem restoration, ecological compensation research, science popularization and other biodiversity conservation projects in Jiangsu Province. Meanwhile, it integrates relevant academic resources of Nanjing University to carry out interdisciplinary biodiversity monitoring and protection as well as the research and development or transformation of equipment and technology.

24

Conservation of Saunders' Gull and Its Breeding Grounds

Saunders' Gull Conservation Society of Panjin City

Approaches: In-situ conservation; Sustainable use of biodiversity; Ex-situ conservation

Targets: Ocean and coastal; Freshwater and wetland; Avifauna;

Location: Panjin City, Liaoning Province, China

Year of Implementation: 1991

Background

Panjin City, Liaoning Province, is located at the estuary of the Liaohe River. There are 249, 600 hm^2 of wetlands, and 1,330 hm^2 of "Red Beach"of *Suaeda glauca* populations. It is the southernmost breeding site for the red-crowned cranes and the largest breeding ground for Saunders' gulls(*Saundersilarus saundersi*) in the world. The Western Pacific spotted seals(*Phoca largha*) also breed there.

The special geographical location and suitable ecological environment make this place an important stop on the East Asian-Australasian Flyway(EAAF) for migratory wading birds, the migration route for anseriformes and red-crowned cranes in eastern China, as well as the migration route for Saunders' gulls between China and Japan. There are as many as 182 species and millions of migratory birds that migrate and stop here every year.

The Saunders' gull is a rare species in the world. It was first discovered in Xiamen, Fujian Province, China in 1871. After more than a century, the Saunders' gull has become the object of exploration and research by ornithologists. The Saunders' Gull Conservation Society of Panjin City (SGCS) has struggled for effective protection of the Saunders' gulls and their breeding grounds for 30 years.

Main activities

SGCS uses the "four-step approach" to solve the problems of habitat protection:

(1) Carry out environmental education

SGCS organizes stakeholders to go to the site to conduct environmental education, so as to make all parties reach a consensus on protecting important habitats of the Saunders' gulls and their breeding grounds, including the breeding grounds in Nanxiaohe.

(2) Utilize public opinion as supervision

SGCS exposed environmental damaging acts in the news, and stopped the ecological damage of the Nanxiaohe area.

(3) Give full play to the wisdom of experts

SGCS invites experts to provide scientific guidance on aquiculture and Saunders' gull habitat restoration such as closing the feeding grounds of Saunders' gulls to avoid harvesting of clamworms.

(4) Make suggestions for the government's decision-making

SGCS makes sure reasonable recommendations can reach decision-makers, and, in turn, has changed some construction plans. For example, the Binhai Avenue changed its designed course and make a turn to the north; Nanxiaohe Conservation Station was built; a development plan involving 300,000 mu(about 20,000 hm^2) of wetland was halted by the government and 12 environmental protection recommendations put forward to the government were accepted and implemented.

SGCS,in cooperation with the government, media, etc., effectively stopped the construction plan on 300,000 mu of wetlands

The main protection activities are as follows: organize volunteers to patrol and protect birds, carry out activities to protect the oceans, clean the coasts and protect the mother river; stop development projects can jeopardize the environment;; organize a publicity team(including reporters) to cover stories of wetlands and birds protection; expose events on destruction of ecological environment; create an environmental education base to pass on environment-friendly ideas; cultivate ecological culture and protect the Saunders' gulls with the power of culture; restore the ecology of Saunders' gull feeding habitats.

Main outcomes

(1) Ecological value

The Saunders' gull is an vulnerable species and has extremely stringent requirements on its habitat. This project has enabled the Saunders' gull to be effectively protected and its population to grow substantially grow.

Facing the situations that the habitats were subjected to continuous and large-scale reclamation, the sewage discharged by aquaculture of shrimps, sea cucumbers and the like not only polluted the seawater, but also caused the surrounding fish and shrimps to almost disappear, and the clamworms in the feeding habitats of the Saunders' gull were dug indiscriminately， the SGCS has carried out effective protection actions. Over the past 30 years, it has protected more than 500,000 mu of wetlands and restored 510 mu of the feeding habitats of the Saunders' gull. Therefore, over the past 30 years, the number of the Saunders' gull has increased from 1,200 in 1990 to 10,507 in 2021.

(2) Social-economic value

This project has been publicizing the Saunders' gull for 30 years, from *Discovery of Saunders' Gull Breeding Ground in Panjin Uncovering the Unsolved Mystery of the World for a Century*, to Saunders' gull being identified as the "Bird of Panjin", to "China's Saunders' Gull Hometown" winning the championship; the Saunders' gulls went from rarely known to star birds; the Saunders' gull started as nowhere on the Wildlife Protection List, to be newly added as a national class-Ⅰ key protected wild animal in China. Its population grew from thousands to tens of thousands. Extensive and continuous publicity has made the protection of birds and animals in Panjin popular.

(3) Innovation

①The "Flying Bird Strategy" was proposed and implemented for the first time. It is not simply about birds, but about effectively carrying out work related to bird protection. The various tasks of the strategy are compared be to various parts of the bird's body, for example, the bird's head stands for the direction of protecting birds, with the Saunders' gull as the flagship species; the bird's body represents habitat protection; the left wing represents environmental education; the right wing represents ecological and cultural cultivation; the bird's claws mean ecological restoration; and the bird's tail means comprehensive protection across regions. The various parts coordinate and cooperate to complement each other.

An illustration of *Saunders' Gull Saves King Han*(*Auspicious Bird*) in *Ancient Fishing Tribes* approved by the State Council to be included in the National Intangible Cultural Heritage List

②This project was the first to propose "Protect Saunders' Gulls with the Power of Culture", where the Saunders' gull culture is cultivated from scratch, and 6,000 pieces of cultural products featuring Saunders' gull are produced in 18 art forms, among which the dance *Fly*, *Saunders' Gull* was performed in Beijing's Bird's Nest Stadium. Three folk tales including *Auspicious Bird*(also titled *Saunders' Gull Saves King Han*) in *Folk Tales of Ancient Fishing Tribes* were approved by the State Council to be included in the National Intangible Cultural Heritage List. Culture plays a subtle protective role.

③Carried out artificial incubation of clamworms to restore the ecology of the feeding habitats for the Saunders' gull.

About the applicant: Saunders' Gull Conservation Society of Panjin City was founded in 1991. It aims to protect the species with rare and endangered birds like the Saunders' gull as its flagship, and their habitats, and to establish successful cases of protecting endangered species for social organizations worldwide.

25

Publicity and Protection of Black-necked Cranes and Wetlands in Zhaotong Prefecture

Volunteers' Association for the Protection of Black-Necked Cranes

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Financial support mechanisms; Traditional knowledge

Targets: Freshwater and wetland; Avifauna

Location: Dashanbao, Zhaotong Prefecture, Yunnan Province, China

Year of Implementation: 1998

Background

There are 19 wintering habitats for black-necked cranes in the 4 counties(districts) of Zhaotong Prefecture. Due to the harsh plateau climate and shortage of food, prominent contradictions were seen between people and the cranes fighting for food and land. In the past 23 years since its founding, The Volunteers' Association for Black-necked Cranes Protection in Zhaotong City of China has been continuously implementing this project.

Main activities

The Association has publicized and advocated the importance of protecting the ecology of the black-necked cranes and their habitats: ①For villagers: popularized knowledge to the local villagers via publicity panels about the protection of the black-necked cranes and wetland ecosystems, and distributed the publication *Black-necked Crane* edited and published by the Association(148 issues so far) and wetland protection knowledge brochures. ②For students: conducted lectures on the protection of the black-necked cranes and wetland ecological environment, and collected paintings and essays related to the protection of the black-necked cranes from students. ③For the general public: created the portal website(http://www.hjhbh.com) for the Association for Protecting Black-necked Cranes with website traffic reaching 2.48 million so far as well as the "Black-necked Crane' WeChat public account

with 81 issues of 500 updates released in total; organized volunteers to participate in the volunteer service activities for loving birds and protecting cranes with the theme of "Close to Nature and Caring for Nature", thus practicing the conservation concepts and leading the trend of the times.

Improve the living conditions of villagers and cope with the human-crane conflicts: The Association has raised RMB 630,000 within 16 years(32 semesters) to support 2,983 poor students, invested RMB 1.06 million to build convenient bridges, teaching buildings, etc., and also built a platform for free medical consultation for the villagers, so that the local villagers can enjoy the benefits from environmental protection and proactively protect the black-necked cranes from the bottom of their hearts.

Hire the villagers to feed black-necked cranes to address the problem of "people and cranes fighting for food". The Association actively seeks assistance and support from international organizations such as the International Fund for Animal Welfare, Global Greengrants Fund, the World Wide Fund for Nature, and employs the local villagers as crane protectors who have fed the cranes up to now with more than 30,000 kilograms of food.

Assist in scientific research and provide information for decision-making. The Association assists provincial scientific research institutions in monitoring the black-necked cranes and drafting reports on environmental impact assessment; it also submits proposals to the CPPCC (the Chinese People's Political Consultative Conference) and participated in local government decision-making.

On November 25th, 2018, a photography exhibition about Action in Protection of Black-necked Cranes was held in the Chenggong Campus of Yunnan University (Shan Youqing/Photographer)

Chen Guanghui, a crane protector from Dahaizi of Dashanbao, hired by the Association to feed black-necked cranes in Dashanbao (Wang Zhaorong/Photographer)

Wang Zhaorong, the founder of the Association, introduced the development of the Association for Protecting Black-necked Cranes to He Junke, the first secretary of the Secretariat of the Communist Youth League Central Committee, who came to the office of the Association for field investigation

Over the past 23 years since its founding, the Association has been promoting the protection of the black-necked crane habitats, and was awarded the gold medal in the first China Youth Volunteer Service Project Competition of the Central Committee of the Communist Youth League.

Main outcomes

(1) Ecological value

Over the last 23 years, the Association has continued to take various measures to make the number of black-necked cranes in Dashanbao continues to grow. In Dashanbao, the largest black-necked crane habitat Zhaotong Prefecture, there were only 350 black-necked cranes in 1992, but as of January 2021, the fixed habitat number of the black-necked cranes was 1,680, which has enabled Dashanbao to become the place with the largest population and density of the black-necked cranes wintering in the eastern part around the world.

The Association's fruitful work has also protected the ecological environment and biodiversity of the black-necked crane habits. The marsh wetlands of Dashanbao accounts for 22.35% of that in Yunnan Province, and the peat swamp of Dashanbao is an important carbon storage reservoir. In Dashanbao, there are 134 species of birds including 14 national key protected species, 223 species of insects including 1 new subspecies, and 10 new record species in China, 72 families of

plants falling into 197 genera and 358 species, and so on. As the marsh wetlands inhabited by the black-necked cranes can effectively conserve water and block sediments, the restoration of wetlands ecosystem in the Dashanbao is of great significance to the water and soil conservation in the lower reaches of the Jinsha River.

(2) Social-economic value

Through the protection and publicity of the black-necked cranes and their habitats, it has raised the awareness of people from all walks of life in ecological and environmental protection. Zhaoyang District has become the "Hometown of Black-necked Cranes in China", while Dashanbao, the habitat of the black-necked cranes, has also become one of the national nature reserves and internationally important wetlands, which have promoted the prosperity and development of works of art, such as literature, painting and photography, related to the black-necked cranes, and have created a distinctive label of cultural tourism for the city.

Since its establishment 23 years ago, the Association has raised a total of 1.7 million RMB of social funds, helped nearly 3,000 students in Dashanbao and surrounding poverty-stricken areas, built new convenient bridges and teaching buildings for the local communities, and invited Chinese medicine experts from inside and outside the province to provide multiple free medical assistance services.

In addition, through scientific research, the Association has provided environmental impact assessments for several organizations and put forward relevant countermeasures and opinions, thus promoting economic development and environmental protection, and achieving a "win-win".

About the applicant: Zhaotong Volunteers' Association for the Protection of Black-Necked Cranes was founded on December 4, 1998. It is a non-profit social organization, expanding its purpose of protecting the black-necked cranes to "protecting wildlife and maintaining ecological balance", and takes the beautiful vision of "harmonious development between humanity and nature" as the ultimate goal. Over the past 23 years, the Association and its individuals have won nearly 30 honors including the "2005 First China Charity Award", the "2010 National Advanced Social Organization", the "2015 First Batch of National Volunteer Service Demonstration Teams", etc., and have made important contribution to the protection of rare birds in Southwest China.

26

3 Years of Multidisciplinary Approach for Conservation of Coastal Forest Habitat and Komodo Dragons on Flores

Komodo Survival Program

Approach: In-situ conservation; Public participation

Targets: Forest; Ocean and coastal; Species diversity

Location: Flores island, Indonesia

Year of Implementation: 2016

Background

The Komodo dragon(*Varanus komodoensis*) is the largest lizard endemic to Eastern Indonesia. Here, dragons exist in protected areas including the Komodo National Park. However, nearly half of the remaining species distribution exists the in unprotected area of the neighboring Flores region. Whilst Komodo dragons and people have interacted for a millennia, there is their increasing recognition of their ongoing habitat loss and the associated conflict is threatening dragon populations in the unprotected area. Similarly, local communities also face livestock depredation and the risk of being attacked.

Komodo dragon

Since its inception in the 2007, Komodo Survival Program (KSP)

has been working with the Indonesian government to help implement Komodo dragon research and a population monitoring program. Furthermore, starting from 2016, KSP has conducted integrative programs that engaged the communities of Flores in conserving these amazing lizards and help find sustainable ways for the people to earn their livelihoods. KSP has helped the communities understand the value of maintaining strong, diverse ecosystems for a more mutually beneficial improve coexistence between humans and Komodo dragon.

Main activities

The project consisted of Komodo population monitoring activity, capacity building for local authorities for population monitoring skills, and human-Komodo conflict mitigation. For the conflict mitigation, the intervention strategy was done in different stages, KSP started with a non-formal meeting with key opinion leaders on alternative ranching method to minimize Komodo dragon attacks in 2016. It was continued with implementation on mitigation strategy (better livestock ranching method, consistent awareness program, citizen science, capacity building, authority engagement and focus group discussion in 2017, and closed with more discussions and workshop on livestock ranching and management method in 2018.

The project progress and success were evaluated using various measurements to help KSP better quantify the core problem: ① understanding the current extent of the Komodo dragon distribution; ②implementation of social psychological scales to assess people perception on Komodo dragon and wildlife; ③ implementation of conduct conflict occurrences survey to archive human wildlife conflict and to propose mitigation strategy; ④implementation of an ethnography study to archive social and cultural background of local community around Komodo dragon's distribution area; ⑤ implementation of social mapping, including participative observatory in order to gain trust to support the conflict mitigation strategy. Besides comprehensive measurements, KSP also deployed numerous public engagement

Monitoring Komodo dragons using camera trap

Stakeholder engagement meeting

programs such as the mapping of potential ecotourism localities across Komodo dragon's habitat in project area. They also included soft and hard skill training for local community members which included English language course for tour guides, wooden statue and handicrafts production, engagement with the largest indigenous local tribe, and establishment of local tourism board in the area to protect the cultural land.

Main outcomes

(1) Ecological value

①Undertook extensive camera trapping survey to measure current distribution of Komodo dragons on the North coast and evaluated impacts of land use change on distribution. Results and recommendations were published in the scientific journal(Ariefiandy et al., 2021) .

②Directly assessed the impact of recent major road developments on the mortality of Komodo dragons. Results and recommendations were published in the scientific journal(Azmi et al., 2021) .

③Undertook predictive modelling exercise to understand the impacts of future climate change on Flores Komodo dragon populations. Results and recommendations were published in the scientific journal(Jones et al., 2020) .

(2) Socio-economic value

①The project improved children's knowledge regarding Komodo dragon conservation through a School Awareness Program. The program employed several approaches including conventional presentation, documentary movie-watching, and storytelling using simple animation based on

storybooks. It was proven that this approach lead to an increase in the understanding of necessary actions regarding Komodo dragons by 36.5%. In 2018, there was an 18.4% increase.

②There was also improved public awareness, livestock management, and willingness to coexist with Komodo dragons. KSP conducted community awareness program sessions, which were attended by religious leaders, village chiefs and community members. The program was opened by movie screenings; using documentary film that KSP created which employed aerial footage of habitat Komodo dragon around their village, followed by a presentation on the ecology of Komodo dragon to give a general background knowledge on the ecology of Komodo dragon and biodiversity conservation. Apart from this program, KSP also conducted training on livestock management. Total occurrences of livestock depredation in 2 project sites decreased by 81% and 85% respectively, in 2016—2017.

Education Program at School

③ The project improved the skills of local authorities and communities. KSP had three training sessions for rangers and local authorities in 2016, 2017 and 2018. KSP also had various trainings for local community members revolving around themes such as English, tour guide, and fam trip to improve their tourism management skills — providing an economic alternative beside livestock farming (which is an industry hugely impacted by conflict with Komodo). This also impacted the formal establishment of local tourism board, led by local tribe, and the agreement to protect the cultural land where the Javan deer(*Rusa timorensis*) had been hunted illegally hunted previously.

(3) Innovation

The most important innovation from this project is its multidisciplinary approach, multiple stakeholders, and joint efforts for greater effectiveness. By understanding all elements relating to the habitat, the species, and the people involved, a rigorous strategy can result in achievable recommendations. This project has successfully addressed the in habitat, species, and people management issues all at once.

About the applicant: Komodo Survival Program (KSP) is an Indonesian-based non-profit organization established in March 2007. The organization has the mission to help devise on management and conservation actions for the Komodo dragon, their natural habitats and local communities.

27

Resources Survey and Artificial Cultivation of Pygmy Waterlily, the Endemic, Rare and Endangered Plant in Yunnan Province

AVIC Trust Co., Ltd.

Approaches: In-situ conservation; Financial support mechanisms; Sustainable use of biodiversity

Targets: Freshwater and wetland; Flora; Freshwater creatures; Ex-situ conservation

Location: Eryuan County, Yunnan Province, China

Year of Implementation: 2020

Background

Pygmy waterlily(*Nymphaea tetragona*), also known as Ziwulian, or small white waterlily, belongs to the Nymphaeaceae family and *Nymphaea* genus, is a wild population of waterlilies in Yunnan plateau lakes, and is one of the five wild waterlilies native to China. It is generally believed that only the pygmy waterlilies growing in Cibi Lake in Eryuan County and a few lakes on the Cangshan Mountain of Yunnan Province are classified as the wild original species that is on the verge of extinction in recent years.

The top view of pygmy waterlily blooming in Wubo pygmy waterlily conservation community in Eryuan County

On the 27th International Biodiversity Day, May 22, 2020, China Environmental Protection Foundation and AVIC Trust Co., Ltd., together with the General Office of Ecology and Environment of Yunnan Province, and the Kunming Institute of

Botany, Chinese Academy of Sciences, jointly launched the project of "Resources Survey and Artificial Cultivation of Pygmy Waterlily, the Endemic, Rare and Endangered Plant in Yunnan Province". As one of the series activities responding to the 15th Meeting of the Conference of the Parties to the Convention(COP15) on Biological Diversity, this project, specially supported by the "AVIC Trust and Green Ecology Charity Trust", aims to develop comprehensive conservation and utilization research on wild pygmy waterlily in Yunnan Province by means of wild resources survey and population ecology research, artificial and efficient cultivation of germplasm resources and cultivated plant display.

Main activities

"AVIC Trust and Green Ecology Charity Trust" is the first Chinese charity trust themed on green ecology. AVIC Trust Co., Ltd. is the main trustee of the trust and it has the charitable goals of supporting the development of green ecological undertakings and disseminating the concept of green ecology. The Kunming Institute of Botany, Chinese Academy of Sciences, serves as the implementing

A researcher carried out biological research on pygmy waterlilies in Wubo pygmy waterlily conservation community in Eryuan County

The wild pygmy waterlilies are growing in a good condition in the Wubo pygmy waterlily conservation community in Eryuan County

agency. With its rich experience in carrying out the protection of rare and endangered plants in Yunnan Province and the strength of the professional team, it has saved the important species of wild pygmy waterlily.

According to this project, comprehensive conservation and utilization research were carried out on the wild pygmy waterlilies in the Cibi Lake, including wild resources survey and population ecology research on target species as well as artificial and efficient cultivation of germplasm resources and cultivated plant display, and knowledge dissemination and science popularization activities were also organized.

Supported by this project, the research and conservation team from Kunming Botanical Garden on wild plants with extremely small population discovered the wild pygmy waterlily population in the sub-alpine lakes around the Cibi Lake in Dali in May 2020. The pygmy waterlily population has been subjected to ex-situ conservation and carefully cultivated, thus being expected to be returned to its home in nature one day.

Main outcomes

(1) Ecological value

By saving the wild pygmy waterlily, the scientific protection and sustainable use of the pygmy waterlily will be realized, and a typical case can be replicated for the protection of aquatic plants in rare plateau wetlands in Yunnan Province and even in China.

(2) Social-economic value

During the first phase of COP15 in 2021, as one of the star species in Biodiversity Experience Garden, the pygmy waterlily was exhibited and propagandized.

(3) Innovation

The "AVIC Trust and Green Ecology Charity Trust" supports the conservation of the endangered plant pygmy waterlilies via charitable trust. It is a new attempt made by the charity trust to participate in green ecology and environmental protection. With institutional advantages of being precise and flexible, the Charity Trust has opened a special channel safeguarding the protection of the pygmy waterlilies with more targeted work and more effective implementation. Furthermore, its characteristics of openness and inclusiveness ushered in a new stage of increasing public attention to biodiversity conservation and introducing diverse entities to become major players in public welfare.

In terms of the model, it is secure to independently manage charity trust funds with the trust company acting as the main trustee on basis of its professional fund management capabilities; and also, charity organizations with professional resources and expertise in the field of environmental protection acting as the co-trustee will make the selection and recommendation of high-quality projects with top environmental and social values possible.

This practice has greater potential for promotion, with an innovative model, rigorous selection procedures, high utilization rate of capital and obvious ecological and environmental benefits.

About the applicant: AVIC Trust Co., Ltd. is a non-bank financial institution approved by the China Banking and Insurance Regulatory Commission, with assets under management of more than RMB 600 billion and net assets of more than RMB 10 billion. The company's shareholders have great strength, and it is jointly initiated and established by units such as the super-large state-owned Aviation Industry Corporation of China, and the overseas investor Singapore Overseas Chinese Banking Corporation. It is a trust company integrating the holding of state-owned enterprises, listing background, Sino-foreign joint venture and concept of military industry. Through professional trust investment and financing services, the AVIC Trust has industry-leading capabilities and levels in the fields of green trust, aviation industry, micro finance, family trusts, charitable trusts, financial technology, etc.

28

Restoration of Degraded Grassland at the Source of the Yellow River

Didi Foundation

Approaches: In-situ conservation; Public participation

Targets: Grassland

Location: Yellow River Source Park, Three-River-Source National Park, China

Year of Implementation: 2020

Background

Known as the "Water Tower of China", the Three-River-Source (also known as Sanjiangyuan) region is the source of the Yangtze, Yellow and Lancang Rivers. It supplies nearly 60 billion cubic m of water to the middle and lower reaches of the three rivers every year and is vital to one billion people in China and Southeast Asia. However, due to climate change and human activities, the alpine meadow and grassland in the Sanjiangyuan region are degrading.

Setting up project propaganda boards in-situ

Through the linkage between the product users and offline environmental protection projects, Didi Foundation encourages users to travel in an eco-friendly manner. At the same time, it cooperates with several public welfare institutions to carry out the

public welfare project "Restoration Project of Degraded Grassland at the Source of the Yellow River" through donation, and supports the restoration and control of 1,203 mu of degraded grassland at the source of the Yellow River in the Three-River-Source National Park (TNP).

Main activities

①Tap into the potential of users of the products and apply the carbon emission reduction methodology of online car-hailing to increase the public's awareness and enthusiasm of environmental protection. In December 2020, the Didi Foundation and Didi Carpool jointly launched the "123 Carpooling Day". This campaign aimed to guide the public to use carpooling to participate in low carbon mobility, and to apply the carbon emission reduction methodology of the online car-hailing to quantify the individual carbon emission reduction achieved by the user in a single trip through carpooling; and the results would be converted into charity donations. This will allow the users to understand the value and significance of the low-carbon mobility by using carpooling in combination with the matching donation public welfare program, and enhance the public's attention to environmental protection.

Grassland quadrat monitoring

In June 2021, rangers irrigated the restored plots with grass seedlings

②Link frontline protection projects to restore degraded grassland and protect biodiversity. While raising the public's awareness of environmental protection through online operations, the Didi Foundation cooperates with the China Environmental Protection Foundation and the Shan Shui Conservation Center to launch the public welfare program "Restoration Project of Degraded Grassland at the Source of the Yellow River" to support the restoration and control of 1,203 mu of degraded grassland at the Yellow River Source Park in the Three-River-Source National Park. In the local area at the Source of the Yellow River in the TNP, the following 4 treatment measures are implemented: grassland planting; artificial irrigation; fence enclosure; and publicity and education project.

Main outcomes

(1) Ecological value

Through the implementation of this project, grass coverage can be increased by more than 30%. With the increment of vegetation coverage, the ability of grassland to conserve water and soil can be improved accordingly. Therefore, the water production and conservation function of the natural grassland source will be restored, and river runoff in the main stream of the Yellow River will be stabilized, which will further strengthen the national ecological safety barrier, and ensure that the "Water Tower of China" has sufficient water resource and remains steady.

(2) Social-economic value

①Advocate for eco-friendly mobility and raise the public's awareness of environmental protection By participating in carpooling, the public can share seats and mileage, and reduce their carbon emission of mobility. This will also influence others to make corresponding changes with individual low-carbon

actions, thereby reducing the overall carbon emissions of the transportation industry, and even enabling changes in the energy system to help cope with global climate change.

②Protect the ecological environment and economy. Through the implementation of this project, the comprehensive coverage of forage in the project area has been significantly increased, the soil structure has been effectively improved, and the ability of the grassland to conserve water and soil, resist wind and stabilize sand has also been further enhanced, so that the grassland degradation in the project area has been effectively contained. This will promote the development of grassland ecosystem towards a virtuous cycle and create better ecological benefits. Furthermore, after comprehensive treatment, the coverage of the forage in the project area will be increased, thus effectively increasing the forage yield in the project area, and therefore producing considerable economic benefits.

(3) Innovation

①The first Internet company participating in the protection practice of the Yellow River Source Park in the TNP. Didi was the first Internet company participating in the ecological protection of "Yellow River Source Park in the TNP". It donated to support the sowing and conservation of grass seeds for the 1,203 mu of degraded grassland. It initiated a new model for enterprises to cooperate with public welfare organizations to promote ecological protection and the development of Sanjiangyuan region.

②Carbon emission reduction methodology of online car-hailing was applied to calculate the carbon emission reduction of the user in a single trip. The project applies the world's first carbon emission reduction methodology of the online car-hailing to calculate the carbon emission reduction of the user in a single trip by using carpooling, which breaks down the online and offline barriers, It not only allows the public to have a clearer understanding of their low-carbon travel choices, encourages users to carry out environmental protection in their daily lives and promotes the reduction of the overall carbon emissions of the transportation industry, but also converts the user's personal carbon reduction behavior into actually implemented conservation projects for realizing the treatment of degraded grasslands in the Sanjiangyuan region.

About the applicant: Didi Foundation is a non-public fundraising foundation registered with the Beijing Municipal Civil Affairs Bureau in December 2018. Didi Foundation actively participates in social welfare activities such as poverty alleviation, natural disaster relief, environmental protection, etc., continues to explore and develop public welfare action paths and public welfare practice models in travel scenarios, supports the construction of public welfare communities of travel service-related groups, advocates and practices a green and low-carbon lifestyle, and participates in and supports social welfare actions that are conducive to spreading social positive energy and building a friendly society.

29

Solving the Problem of Stray Dogs on the Qinghai-Tibet Plateau

Gangri Neichog Research and Conservation Center

Approach: In-situ conservation

Targets: Species diversity

Location: Qinghai-Tibet Plateau, China

Year of Implementation: 2014

Background

The Tibetan mastiffs, once a good helper of herdsmen and were advertised as a symbol of wealth over the past decade, have been abandoned in recent years. They have either become hot pot food or strayed around villages, towns and temples in Tibet. Sometimes the Tibetan mastiffs look for food in garbage dumps, and sometimes they are fed by local Tibetan women them with leftovers. Besides, they may involve in cattle and sheep hunting in pastoral areas in herds. Or they might even hunt wild animals or scramble for food with the wild animals.

Some wild animals like blue sheep(*Pseudois nayaur*), plateau pika(*Ochotona curzoniae*), Hymalayan marmot(*Marmota himalayana*), red fox(*Vulpes vulpes*) and argali(*Ovis ammon*) used to be found in the feces of stray dogs, while the blue sheep, the pika and the marmot are the main food of snow leopards, brown bears and wolves(*Canis lupus*) which are the top carnivores on the Tibetan Plateau.Stray dogs not only exert an impact on wildlife, but also influence the lives of local people. According to the survey on the attitudes towards stray dogs, 82.1% of the interviewees agreed it was a tough problem in their living area. On November 24, 2016, an 8-year-old girl died of an attack by a stray dog in Nangqian. Biting people, soiling the surrounding environment and stealing food are the problems caused by stray dogs that are most frequently reported by the local people. Hydatid disease is now prevalent in Tibetan areas. In severe cases, it could be fatal. Dogs are a key source of transmission, and a response is urgently needed.

But the international culling practices cannot be accepted by the local people. Based on the

survey, the local people opposed not only the killing of stray dogs but also "euthanasia". They deemed that "deaths in all forms" were the greatest pain in life. Without the death penalty, how could we solve the problems brought by thousands of stray dogs?

Main activities

Gangri Neichog Research and Conservation Center(hereinafter Gangri Neichog) mobilized local forces to sterilize the stray Tibetan mastiffs, and cooperated with local temples to promote adoption. In other words, the idea of "capture+adoption+sterilization(training local veterinarians) + immunization" could alleviate this contradiction. The local people were enabled to understand the hazards of the stray Tibetan mastiffs and safety protection measures by filming documentaries and distributing manuals of stray dogs. Besides, the Gangri Neichog discussed governance methods together with the local government, animal husbandry and veterinary stations, temple lamas, etc., and introduced external veterinary trainers to train Tibetan local veterinarians in techniques of sterilization operation. Therefore, the local people were enabled to be aware of and have the ability to solve the problem of stray Tibetan mastiffs. As of October, 2020, 71 local veterinarians had been trained in the dog sterilization operation. And 700 dogs had been sterilized and over 500 stray dogs had been adopted via cooperation with the temples. Such practices have been accepted by the government.

Local veterinarians are carrying out practical training on dog sterilization operation

A stray dog shelter in Yushu, Qinghai

Main outcomes

(1) Ecological value

There are 130,000 stray Tibetan mastiffs in the Sanjiangyuan region in Qinghai Province at present. The activity areas of about 5% of the individuals are highly overlapped with those of the wild animals. Evidence has shown that the stray Tibetan mastiffs have a certain influence on the activities of the local carnivores in space and time as they may compete for food. Therefore, in the relatively fragile habitat on the Qinghai-Tibet Plateau, this project can alleviate the threat of the stray dogs, a new wild species, to the snow leopards, the red foxes, Tibetan foxes, the rock sheep and other rare wild animals. In addition, this project also reduces the risk of disease transmission among stray dogs and other wild animals.

(2) Social-economic value

The Tibetan-Chinese-English trilingual documentary *Abandoned Tibetan Mastiffs* filmed by Gangri Neichog reflects the situation, causes, and local response of stray dogs on the Qinghai-Tibet Plateau. This documentary has won the Independent Spirit Award and the Best New Artist Award at the Shanghai International Green Film Festival. Moreover, it has received 5.13 million hits on the Internet, and the related reports have attracted wide attention. Gangri Neichog also handed out the handbook titled *Why Should We Care About Stray Dogs* in Chinese and Tibetan language to raise the awareness of the stray dog problem among locals and reduce risks of contagious diseases brought by stray dogs.

Carrying out theoretical training on dog sterilization operation for local village-level veterinarians

(3) Innovation

The stray dog problem on the Qinghai Tibet Plateau is a new ecological challenge driven by social development and economic interests. It also appears in the Tibetan areas with strong religious beliefs and culture. According to the practice, it is obvious that the Gangri Neichog tries to have an open and transparent discussion with the affected communities and related stakeholder groups, and empower communities themselves to avoid understanding the "stray dog problem" from the perspective of ecological influence only. Based on local ecological and cultural concepts, the Gangri Neichog explored the solution of "capture+adoption+sterilization(training local veterinarian) +immunization"; and as a social organization, the Gangri Neichog connects the governments, the communities(local veterinarians), the temples and the veterinarian trainers beyond the Tibetan areas, and gives full play to all stakeholder groups in solving the stray dog problem.

About the applicant: Gangri Neichog Research and Conservation Center was officially founded and registered with Qinghai Civil Administration in 2014. Its vision is to respect each life and promote each life to sustainably share the well-being brought about by nature. On the Qinghai-Tibet Plateau, it started with field investigation and research, hoping to understand the relationship between "local people and nature" from the traditional wisdom; and furthermore, it provided an ethnic and historical perspective for nature protection, fed back the research results to communities, and shared solutions about dealing with environmental issues.

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Community Forestry Enabling Long-term Stewardship of High Biodiversity Value Forests by Local Communities in Indonesia

People Resources and Conservation Foundation

Approaches: In-situ conservation; Public participation; Financial support mechanisms; Sustainable use of biodiversity Access and benefit-sharing of genetic resources Traditional knowledge

Targets: Forest; Freshwater and wetland; Farmland; Flora; Mammals; Amphibians; Avifauna; Freshwater creatures; Germplasm resource conservation

Location: Indonesia

Year of Implementation: 2010

Background

The forests of Borneo are home to many threatened species, including the critically endangered Bornean Orangutan(*Pongo pygmaeus*), the vulnerable Tomistoma Crocodile(*Tomistoma schlegelii*), and several others species of interest. The forests suffered from degradation practices that included industrial plantations(oil palm in particular), logging, mining, agricultural encroachment, and forest fires have caused the rapid disappearance of environments like Dipterocarp lowland and peat swamp forests across Borneo. The community-managed forests together with protected areas like the Danau Sentarum National Park, give refuge to many of Borneo's most iconic and endangered species under the increasing pressure of environmental degradation.

Main activities

With most biodiversity confined beyond the boundaries of protected areas, which are in many cases weakly managed, conservation through community stewardship is vital.

PRCF works with local forest-dependent communities and supports the establishment and development of "Village Forests"(*Hutan Desa*) and the building of village stakeholder capacities for

long-term conservation management of high conservation value forests. It also helps villages to reach sustainable livelihoods through conservation- friendly activities.

Existing village forest management institutions were strengthened with the capacity to plan and carry out forest conservation practices. This was implemented in tandem with support to the village community for much needed socio-economic development, demonstrating that substantial conservation of forest and endangered species can be achieved while also simultaneously benefiting local communities. This represents a viable alternative to the conventional paradigm of biodiversity conservation.

Community patrols in Hutan Desa forests(top and bottom)

Main outcomes

(1) Ecological value

PRCF Indonesia works with local forest-dependent communities to safeguard the habitat of globally threatened species, including the critically endangered Bornean Orangutan, Sarawak Surili (*Presbytis chrysomelas*), Helmeted Hornbill (*Rhinoplax vigil*), the endangered Mueller's Gibbon (*Hylobates muelleri*), and the vulnerable Tomistoma Crocodile and Rhinoceros Hornbill (*Buceros rhinoceros*). The PRCF Community Forestry and Biodiversity Program is in the process of helping local communities manage over 50,000 hm^2 of high conservation value forest, as Hutan Desa. Based on the Hutan Desa initiative, which started in 2018, there is an ongoing efforts to seek to secure additional certification for 20 or so villages, enabling long-term sustainable management of over 65,000 hm^2 of high conservation value forests through community stewardship. Further, this will be replicated in several coastal mangrove villages forests (presently in planning for 5 villages), covering an additional 9,700 hm^2 of mangroves.

Nanga Lauk Village Hutan Desa Forest Restoration Team

(2) Social-economic value

Current plans aim to engage approximately 2,000 households across several villages. The PRCF organization acts as a facilitator and provider of technical support, monitoring, and a source of long-term mentorship. Stakeholder communities benefit from added long-term legal tenure to village lands, long-term funding from biodiversity offsets and carbon credits, institutional development support, livelihood development support, and support for the conservation of village natural resources. Furthermore, an intact ecosystem provides local people with an array of ecosystem services, including protection against floods, maintenance of microclimatic conditions, provision of many forest products for local consumption and the broader market(for example, forest honey), and steady water flow that allows for cultivation.The forest ecosystem also increases the socio-ecological resilience of the most vulnerable communities to the impacts of climate change.

(3) Innovation

This project puts local people in the center for biodiversity conservation through enabling sustainable stewardship of bio-diverse forests. The project looks beyond the boundaries of protected areas to realize crucial conservation outcomes while improving the livelihoods of forest resource-dependent communities. This project also demonstrates that livelihood improvement and biodiversity conservation are not mutually exclusive, and substantial co-benefits can be realized.

About the applicant: People Resources and Conservation Foundation(PRCF) is a US-based 501 (c) 3 non-profit, non-government and non-membership organization. PRCF promotes biodiversity conservation, conservation and wise use of natural resources, and healthy social and economic development. The organization works primarily with rural communities in Indonesia, Cambodia, Myanmar, Thailand, Vietnam, especially with local ethnic minorities living nearby protected areas and remnants of high-value forests.

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Lao Niu Ecological Restoration and Protection Project

Lao Niu Foundation

Approaches: In-situ conservation; Public participation; Financial support mechanisms; Ex-situ conservation

Targets: Forest; Grassland; Farmland; Arid and semi-arid area; Flora; Amphibians; Avifauna

Location: Horinger County, Baarin Left Banner and Xilingol League, Inner Mongolia Autonomous Region; Zhangjiakou City, Hebei Province, China

Year of Implementation: 2010

Background

There is only one earth, if the earth environment deteriorates, human happiness will be empty talk. This is what has touched the Inner Mongolia Lao Niu Foundation(hereinafter Lao Niu) the most, because Inner Mongolia, where Lao Niu is located, is an ecologically fragile arid and semi-arid, desert For Lao Niu, “Lucid waters and lush mountains are invaluable assets” is not a slogan, but real experience.

The “Lao Niu Ecological Restoration and Protection” Project initiated by Lao Niu is dedicated to providing a feasible plan for the arid ecosystem that is suitable for the local “Harmonious Development of Ecology and Economy”. Arid areas account for 41% of the earth’s land area, support about 38% of the world’s population, possess about 1/3 of the world’s biodiversity hotspots, and provide habitats for 28% of endangered species. The types of ecosystems in arid areas mainly include prairie with sparse forest, shrub, grassland and desert, etc., which are subjected to strong water stress due to lack of water. The arid ecosystems are very fragile and very sensitive to extreme weather events and human activities, which bring serious challenges to the sustainability of local economic development and livelihood.

Main activities

① In 2010, Lao Niu, in collaboration with the Nature Conservancy(TNC), China Green Carbon Foundation, and Inner Mongolia Forestry and Grassland Bureau, initiated the “Inner Mongolia Shengle

View before project implementation

A corner of the project site after restoration

International Ecological Demonstration Zone" project in the arid and semi-arid regions of Horinger County, Inner Mongolia, which has important ecological barrier functions in China. Hundreds of millions of RMB were invested to explore and demonstrate ecological restoration in four aspects, namely climate adaptation, vegetation restoration, water resources management, and green industry. Nearly 40,000 mu of degraded land has been restored, more than 3.3 million arbors such as Hailar pine(*Pinus sylvestris var. mongolica*) and dragon spruce(*Picea asperata*) have been planted, with a survival rate of over 85%, increasing biodiversity from less than 30 species to more than 80 species, and fixing an average of 25,000 t of soil per year. Soil erosion has been effectively controlled, and the total amount of potential water storage in the soil has increased from 4×10^6 t to 5.3×10^6 t. In the next 30 years, it is expected that 220,000 t of carbon dioxide will be absorbed and fixed, of which 160,000 t have been subscribed by the Walt Disney Company.

② Relying on the results of ecological restoration, Lao Niu established cooperatives in communities, making more than 10,000 people in 13 administrative villages covered by the project benefit from climate-smart agriculture and smart grassland management. Among them, the average income per household in the cooperative increased by RMB 10,492 per year. A sustainable development model of "economic development supports ecological restoration which guarantees economic development in turn" has been explored. With the support of the People's Government of Baarin Left Banner in Chifeng City, relevant experience has been applied to the "Comprehensive Improvement Project for Baarin Left Banner Villages in Extreme Poverty Project" jointly initiated by the Three Gorges Corporation, Lao Niu, and TNC, which promoted 80,000 mu of dryland farming,

explored and practiced green agriculture and animal husbandry development models, restored and improved soil health and ecological security, enhanced agriculture's ability to mitigate and adapt to climate change, and at the same time increased community incomes and achieved targeted poverty alleviation and rural revitalization, providing successful experience for China's agricultural production in response to climate change.

Relevant experience in smart grassland management was replicated and promoted in Xilingol League in Inner Mongolia for 80,000 mu, and through smart grassland management, a guiding breeding plan was developed for herders using technical means such as satellite remote sensing, meteorological data, mobile phone APP, and monitoring data, to maximize the utilization of grassland resources, increase the income of herders and achieve healthy and sustainable use of grassland resources.

A"Hundred year-old apricot tree" from the same perspective before and after ten years

③ In Zhangjiakou City, Hebei Province, Lao Niu replicated and promoted 30,000 mu of carbon sink forests with arbors, shrubs, and grass". After discussion of the cooperation intention with the Mongolian University of Life Sciences, the two parties jointly formulated a local "Harmonious Development of Ecology and Economy" plan for the relevant areas.

Main outcomes

(1) Ecological value

This project has restored the ecological environment of the areas covered thereby and improved the service function of ecosystem, contributing to the mitigation of climate change. Taking the "Inner Mongolia Shengle International Ecological Demonstration Zone" in Horinger County, Inner Mongolia as an example, it is estimated that the potential economic benefits generated by the restoration of the ecological service function and ecological value of the project site since the start of the project can reach more than RMB 15 million per year.

(2) Social-economic value

The multi-effect design was added at the early stage of the project, hoping to take into account the needs for coordinated development between the local community and the local species diversity while considering carbon sinks. As of 2021, the project has created 1.14 million workdays of temporary employment opportunities and 18 long-term positions and benefited 2,690 rural households in 13 administrative villages in 4 townships, with more than 10,000 beneficiaries. During the management and protection period, through forest farming, dryland farming, sustainable grazing management and cooperatives, the average income of some farming households in the cooperative has increased by RMB 10,492 per year.

(3) Innovation

The design concept and model of the project are innovative in that the project is not a single afforestation project, nor a single community work project, but a feasible plan which, under the condition of paying attention to the climate change impacts and by virtue of scientific planning, rational restorations, and sustainable management, carries out systematic restoration for a stretch of land, with corresponding restoration and management actions evaluated and adjusted via scientific monitoring, which is further taken as an experimental demonstration base to explore various forms of "Harmonious Development of Ecology and Economy' suitable for arid ecosystems.

About the applicant: Lao Niu Foundation is a charitable foundation established at the end of 2004 by Mr. Niu Gensheng, the founder, former chairman and president of Mengniu Dairy Group, together with his family, through donating all the shares and most of the dividends held in the Mengniu Dairy.

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Cadillac Guarding G7 Highway Ecological Charity

Cadillac Brand of SAIC General Motors Corporation Limited

Approach: In-situ conservation

Targets: Arid and semi-arid area

Location: Xinjiang Uygur Autonomous Region and Inner Mongolia Autonomous Region, China

Year of Implementation: 2018

Background

Desertification is a serious problem of the global environment, and China is one of the countries with the most serious desertification in the world. The Beijing-Xinjiang Expressway(G7) connects Beijing and Urumqi, passing through five provinces and one municipality, with a total length of 2,739 km, and is the world's longest desert-crossing expressway.

In order to support China's desertification control and respond to the "Belt and Road" initiative, Cadillac of SAIC General Motors Corporation Limited(hereinafter Cadillac) launched the "Belt and Road Ecological Conservation Project" along the G7 highway.

Main activities

Cadillac and its dealers launched the Sand Harness Project with the China Environmental Protection Foundation and the Euphrates Poplar Project with the China Green Foundation to carry out reforestation in Xinjiang Uygur Autonomous Region (Xinjiang) and Inner Mongolia

Seaberry(*Hippophae rhamnoides*) and Chinese tamarisk(*Tamarix chinensis*)

Saplings growing at the project site

Autonomous Region (Inner Mongolia)respectively, the two autonomous regions having the largest desertification area in China, to protect the ecological environment around the G7 and promote desertification control.

Starting from 2018, a total of RMB 45 million has been invested over three years. By 2021, the project had planted more than 990,000 seedlings, of which 270,024 seedlings were planted in Ejina Banner of Inner Mongolia under the Euphrates Poplar Project and 460,106 and 265,366 seedlings in Alar City and Qitai County of Xinjiang respectively under the Sand Harness Project.

This project insisted on the principle of "planting trees according to local conditions", respected the law of nature and made scientific testing and evaluation of the compatibility between each plot and seedling, forming different planting plans for areas of different degrees of desertification and salinity.

The selected varieties of trees are all common native desert plants, including Euphrates poplar(*Populus euphratica*), the Siberian elm(*Ulmus pumila*), bunge ash(*Fraxinus bungeana*), Chinese tamarisk(*Tamarix chinensis*), Russian olive(*Elaeagnus angustifolia*) and seaberry(*Hippophae rhamnoides*), which are drought-resistant and drought-tolerant, with strong root systems and adaptability. Some of these species have strong abilities to resist salinity and have the function of fixing sand and improving soil fertility. Some areas are equipped with energy-saving water conservancy measures such as drip irrigation to further improve the utilization rate of water resources.

Main outcomes

(1) Ecological value

The survival rate of afforestation in this project is much higher than that of the national afforestation standard in the same area, and the ecological benefits are obvious. It plays the role of wind

and sand control and water and soil conservation, alleviates the degradation of the ecological environment caused by drought and human activities, promotes the restoration and reconstruction of vegetation, effectively reduces the erosion of roads by wind and sand, and drives local tourism and economic development.

(2) Social-economic value

The project called upon car owners, dealers, employees, and the general public to donate through online and offline promotions via Tencent Public Welfare and Alipay Public Welfare platforms. Through Alipay's "Ant Forest", people have participated in public welfare through step donation, games, and charity sales for nearly 3 million man-times in the past three years and understood the relationship between desertification control and tree planting. Netizens' donation has exceeded 8 million yuan. From 2019 to 2020, Cadillac ranked the second on Tencent's "99 Giving Day" Corporate Public Welfare List for two years in a row.

The project was awarded as the Outstanding Contribution Advanced Entity of "20th Anniversary of Care for Forest" in 2019 and the Annual Public Welfare Case in the 7th "Jinxuan Award" in 2021.

(3) Innovation

The project is China's first ecological conservation project focusing on the highway concept and combines car culture, and highway, with afforestation, exploring ways to manage different types of desertification along highways, helping local communities reduce desertification erosion and building special ecological corridors along the G7 highway.

This project was actively innovated in the promotion of ideas public participation and developed and built G7 public welfare as IP(meaning influential image or brand) . In 2018, the project put forward the G7 concept, focusing on guarding the beauty of the G7, and in 2019, it cooperated with Pantone to define the color of poplar seeds breaking ground as "G7 Green". In 2020, a cartoon image of the spokesperson of this color, "Little Green 7" was created, and peripheral figurines, blind boxes, picture books, and mini-games were developed. The above products were sold and donated at the 99 Giving Day and other activities to continue to support the Poplar Project.

About the applicant: In 2004, Cadillac Brand of SAIC General Motors Corporation Limited entered China and quickly became one of the country' s fastest growing luxury brands through product design, technological innovation and service.

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Protection and Restoration of Water Sources in the South-north Water Diversion Central Route

The Nature Conservancy(USA) Beijing Representative Office

Approaches: In-situ conservation; Technological innovation; Sustainable use of biodiversity

Targets: Forest; Freshwater & wetland; Farmland; Avifauna

Location: Danjiang Wetland National Nature Reserve in Xichuan County, Henan Province and its surroundings, China

Year of Implementation: 2018

Background

The Danjiangkou Reservoir is the water source of the South-North Water Diversion Project(SNWD)'s Central Route. The ecological safety of the area around the reservoir directly affects the water safety of about 79 million people in Henan, Hebei, Beijing and Tianjin. The area is also one of the areas with the richest biodiversity in Henan Province. However, the ecological environment around the Danjiangkou Reservoir is very fragile, with long-standing problems such as rocky desertification in the mountains, soil erosion in slope land, agriculture non-point source pollution, and unreasonable use of wetlands.

Rocky-deserted hillside

Since the beginning of 2018, The Nature Conservancy(TNC) has been working with the Henan Forestry Administration and the Xichuan County Government to carry out ecological conservation and restoration in and around the Danjiang Wetland National Nature Reserve(herein after Danjiang Wetland) in Xichuan County, Henan Province, in an

effort to safeguard the ecosystem health and important ecosystem service functions in the water source areas of the SNWD project.

Main activities

The Nature-based Solutions(NbS) used in the Project are as follows: protecting surviving wetlands, forests, and biodiversity, and preventing actions having further negative impacts on the ecological environment; restoring damaged wetlands and forest ecosystems(rocky-deserted land); introducing regenerative agricultural management practices such as covering crops to sustainably reduce soil erosion and agriculture non-point source pollution; optimizing agricultural cultivation structures and exploring green development models. The Project allowed local communities to benefit from the green development models, promoted sustainable economic and ecological benefits, and put into practice concept of "Lucid waters and lush mountains are invaluable assets".

Over the past three years, the China TNC Henan Project has assisted the Danjiang Wetland to restore 6,000 mu of degraded wetlands; it has assisted in strengthening the capacity of patrol and management, cooperated in preparing a management plan for patrol and management and organized five professional skills training sessions; it has cooperated with several institutions to build a comprehensive demonstration park for damaged ecosystem(forest and wetland) restoration with a total area of over 1,500

Rocky desertification restoration project: tree-planting

Water-level-fluctuating zone of Danjiang Wetland

mu. The Project has worked with the Henan Provincial Forestry Bureau Administration, Henan Danjiang Wetland Protection Office, Xichuan County Agricultural Bureau, Dashiqiao Township Government, Wuhan Botanical Garden of the Chinese Academy of Sciences, and local enterprises to develop a demonstration area for green agriculture technology with a total area of over 40 mu. At the same time, the Project has also actively explored the development of new green industries such as forestry carbon sinks and ecological bird watching, which would continue increasing the income of local community residents.

Main outcomes

(1) Ecological value

①The Danjiang Wetland is the last barrier for Danjiang water to enter the reservoir, a filter and purifier of water quality at the source of the SNWD Central Route. Safeguarding the water environment at the water source of the SNWD Central Route has the same importance as safeguarding long-term stable and safe water supply.

②The Project has protected the rich biodiversity and the habitats of multiple rare waterfowl species. The reserve is rich in flora and fauna. To date, 405 species of birds have been recorded, making it the richest area in Henan Province in terms of bird biodiversity. In the reserve, there are 578 species in 335 genera of 118 families of plants, 19 species of wildlife protected under National Class-Ⅰ, 75 species under Class-Ⅱ, 88 species of fish, 13 species of amphibians, 19 species of reptiles and 39 species of animals.

③The wetland ecosystem in the reserve is in constant development and evolution due to the

implementation of the SNWD Central Route. It is a natural laboratory for wetland ecosystem monitoring and research on development and evolution, therefore having important scientific research values.

(2) Social-economic value

①The Project has helped more than 20 households to increase their annual income by more than RMB 2,000 through providing labor service; the rosemary and grass growing technology in orchards have reduced the inputs in weeding, pesticide, and fertilizer by about RMB 200 per mu, greatly freeing up the labor force.

②During the Project, the public attention was increasing. The results of the Danjiang Wetland biodiversity monitoring have been reported by Dahe Daily, Nanyang Daily, and many other media outlets, and the TNC Danjiang Project has supported the Danjiang Wetland to publish *The Great Danjiang Wetland.*

(3) Innovation

①Systematic conservation concept: according to the needs of environmental characteristics, land use, and conservation objectives at different elevations in the reservoir area, targeted conservation and restoration models are explored to create a three-dimensional integrated demonstration base.

②Managing the "land cancer" - rocky desertification with near-natural ecological restoration technology: guided by ecological principles, the Project followed the premise of the natural laws of the ecosystem. Through appropriate human intervention(native growth-promoting bacteria, plant nursing, etc.), the limiting factors of ecological restoration were broken to stimulate the ability of the ecosystem to repair itself, and accelerate the process of positive succession, so as to build up a healthy ecosystem.

③Covering crop technology: agricultural grass mulching prevented soil erosion while improving soil quality, suppressing weeds, increasing nutrient and water utilization, and reducing costs.

④721 Collective Economy Model: rosemary(*Rosmarinus officinalis*) cultivation was practiced in a way that the net profit is shared between the contractor, the village collective, and the enterprise on a 7∶2∶1 basis, promoting the transformation of the collective economy through the "government + company + collective economy" model.

About the applicant: The Nature Conservancy(TNC), founded in 1951 and with its headquarters in Arlington, Virginia, USA, is one of the largest non-profit natural environment conservation organizations in the world. TNC has been committed to protecting the land and water areas of important ecological value in the world, so as to maintain the natural environment and promote human well-being. In 1998, TNC was invited by the Chinese Government to enter China, with its headquarters in Beijing. TNC has carried out conservation projects in land, fresh water, climate change, oceans, cities and other fields, and achieved remarkable results.

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Collective Forest Management in Liziba Village, Bikou

Baishuijiang National Nature Reserve Administration, Gansu Province

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Policy-making and implementation

Targets: Forest; Flora; Mammals; Amphibians; Avifauna

Location: Liziba Administrative Village, Bikou Town, Wenxian County, Gansu Province, China

Year of Implementation: 2008

Background

Liziba Village is located in the southernmost part of Gansu Province and under the administration of Bikou Conservation Station of Baishuijiang National Nature Reserve, it is the only village on the southern slope of the Motian Hill in Baishuijiang National Nature Reserve. It borders Qingchuan County of Sichuan Province in the east, Dongyanggou Nature Reserve of Sichuan Province in the south, and Tangjiahe Nature Reserve in Sichuan Province in the west. The total area of the village is 6,500 hm^2, and nearly 4,000 mu of private forest(forest owned by farmers themselves) . Liziba contains 9 communities, with a population of more than 700 people. Averagely, every household has 20 mu of land. The private forest here is relatively abundant, so the villagers' livelihood mainly depends on forest timber.

Main activities

Baishuijiang National Nature Reserve, combining the characteristics of Liziba, innovatively established a collective forest management and protection mode with the characteristics of Liziba. In accordance with the principle of “assigning responsibility to people, distributing management area to families, allocating funds to the village, conducting funds supervision of the station”, the Reserve improved the management and protection system, regulated community organizations, and ensured villagers to participate in the management and protection.

In 2008, certain impacts were applied by the "512" earthquake on Liziba. Shan Shui Conservation Center, together with the Community and Biodiversity Conservation Research Center of the Lanzhou University, supported the reconstruction and ecological conservation of Liziba, improved the management system of patrol team and internal resource and carried out an agreement protection project, which achieved positive protection results.

The forest patrol team has been built since 2003 and had participating in the agreement protection project from 2008 to 2011, and a relatively perfect forest protection system was gradually formed. During Phase Ⅱ of the Natural Forest Protection Project in 2011—2020, Bikou Reserve Station and Liziba signed a contract titled *Contract for Managing and Protecting of Baishuijiang National Nature Reserve Forest*, *Gansu Province*. The village committee signed a contract with each patrol team worker, which is titled *Contract for Managing and Protecting Liziba Village Native Forest*, *Bikou Town in Wen County*, *Gansu Province by Forest Patrol Team Constituted by Villagers*. Under the guidance of the National Nature Reserve Administration and the Shan Shui Conservation Center, a mature community co-management system has been formed: villages of the community form professional forest patrol teams, all villagers join in the management, and the village committee allocates the management funds; the National Nature Reserve Administration organizes training to enhance villagers' ability and level of independent management and protection; each conservation station supervises and evaluates the whole

Professional forest patrol team of Liziba Village

Liziba tea garden

process of the Tianbao Collective Forest management and protection of villages in its jurisdiction. The National Nature Reserve Administration organizes a working group to supervise and guide the fund use and the management and protection work, and check for gaps to ensure the operation of special funds and the fulfilment of the responsibility of management and protection.

After the research of each village and community in the Reserve area, the Baishuijiang Nature Reserve formulated and improved the *Rules for Managing and Protecting the Collective National Non-commercial Forest: Tianbao Project (Phase II).* Cooperated with Shan Shui Conservation Center, the Reserve revised the contract templates between the National Nature Reserve Administration and the reserve station, between reserve stations and villages, between villages and forest patrol teams, and between villages and villagers and improved the indicators and methods for assessing protection effectiveness, making it more operable.

Main outcomes

(1) Ecological value

Villagers under the jurisdiction of Baishuijiang have benefited from managing and protecting natural forest resources. Their minds have been opened and their ecological conservation awareness has been improved, therefore illegal activities such as illegal felling and transporting of trees, illegal purchase of timber, poaching, deforestation and land reclamation were brought under control. Local people actively and spontaneously protect forest resources, rescue wild animals, and carry out patrol monitoring in the community. The forest line at the edge of the experimental area moved backward in the 1980s and 1990s but it moves forward at present, with the natural resources and ecological environment significantly improved. In 2019, the National Nature Reserve Administration approved Liziba Village's patrol team to take the lead in carrying out grid monitoring in Liziba area. Since then, Liziba Village's patrol team has set up more than 40 infrared cameras in the wildlife habitats, and captured pictures of mother giant pandas together with their children for several times.

(2) Social-economic value

This project has prompted the villagers in the community to change their thinking, from the traditional living habit of relying on mountains to taking many measures to develop forestry and fruit industry, undergrowth planting, livestock breeding, labor services output and actively participating in management and protection, and from implementers of forest resources destruction such as deforestation and over-collection to the major managers of the Tianbao Collective Forest. According to local natural conditions, Liziba developed economic forest industries such as walnut and chestnut, cultivation and processing of tea and edible fungi, planting of Chinese herbal medicines such as tianma(*Gastrodia elata*) and Chonglou(*Paris polyphylla*), beekeeping and free-rang chicken breeding. Farmers jointly established tea cooperatives, registered their own tea brands, and the e-commerce platform flourished.

(3) Innovation

This Project has created a management and protection mode of collective forest in the reserve, namely "assigning responsibility to people, distributing management area to families, allocating funds to the village, and conducting funds supervision of the station".

About the applicant: Gansu Baishuijiang National Nature Reserve Administration was established in 1978. It is a county-level institution directly under the State Forestry and Grassland Administration with independent legal person. It is under the dual leadership of the State Forestry and Grassland Administration and the Gansu Provincial Forestry and Grassland Administration. It is located in Wenxian County, Longnan City, Gansu Province. The Administration has 13 functional departments, 6 conservation stations, and 1 giant panda breeding and breeding center, with 268 employees.

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Saihanba Artificial Forest Ecosystem is Healthy and Sustainable and Promotes the Coordinated Social and Economic Development of Surrounding Areas

Saihanba Mechanical Forest Farm in Hebei Province

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity

Target: Ecosystem diversity

Location: Saihanba Mechanical Forest Farm, Hebei Province, China

Year of Implementation: 1962

Background

Saihanba Mechanical Forest Farm is located in the northmost part of Hebei Province and the southern edge of the Hunshandake Sandy Land in the Inner Mongolia Plateau Autonomous Region, with an altitude of 1,010 to 1,939.9 m. The maximum temperature is 33.4℃, the minimum temperature is minus 43.3℃, and the annual average temperature is minus 1.3℃. The average annual snow cover duration is 7 months, the average annual frost-free period is 64 days, and the average annual precipitation is 479 mm. Established in February 1962 with the approval of the Ministry of Forestry, Saihanba Mechanical Forest Farm is a large-scale state-owned forest farm directly managed by the Forestry and Grassland Bureau of Hebei Province. It is located in the forest-grassland transitional zone of China, and the main tree species in the forest ecosystem are Dahurian larch(*Larix gmelinii*), Hailar pine, Chinese

Forest

red pine(*Pinus tabuliformis*), dragon spruce, white brich(*Betula platyphylla*), etc. It's home to 256 species of terrestrial vertebrates, 13 species of fish, 548 species of insects, and 625 species of plants. Among them, 33 species of animals and 9 species of plants are under national key protection.

Main activities

Since the establishment of Saihanba Mechanical Forest Farm in 1962, generations of the forest farmers have listened to the call of the Communist Party of China and responded to the call of the nation, worked hard in the desert and were dedicated, turning the wasteland into a forest, interpreting the idea that "Lucid waters and lush mountains are invaluable assets", and forging the Saihanba spirit of keeping mission firmly in mind and pursuing green development.

Through the efforts of several generations of forest farmers and the participation of tens of thousands of volunteers, the forest coverage rate of the forest farm has increased gradually, and the stability of the forest ecosystem has increased year by year as well. Compared with the initial stage of the Forest Farm's establishment, the forest area has increased from 240,000 mu to 1.151 million mu, the forest coverage rate has increased from 11.4% to 82%, and the stock of living trees has increased from 330,000 m^3 to 10.368×10^6 m^3. The forest stock per unit area is 2.76 times the average of that of national artificial forests. The wetland covers an area of 103,000 mu and is an important water source for the two major water systems of Luanhe River and Liaohe River.

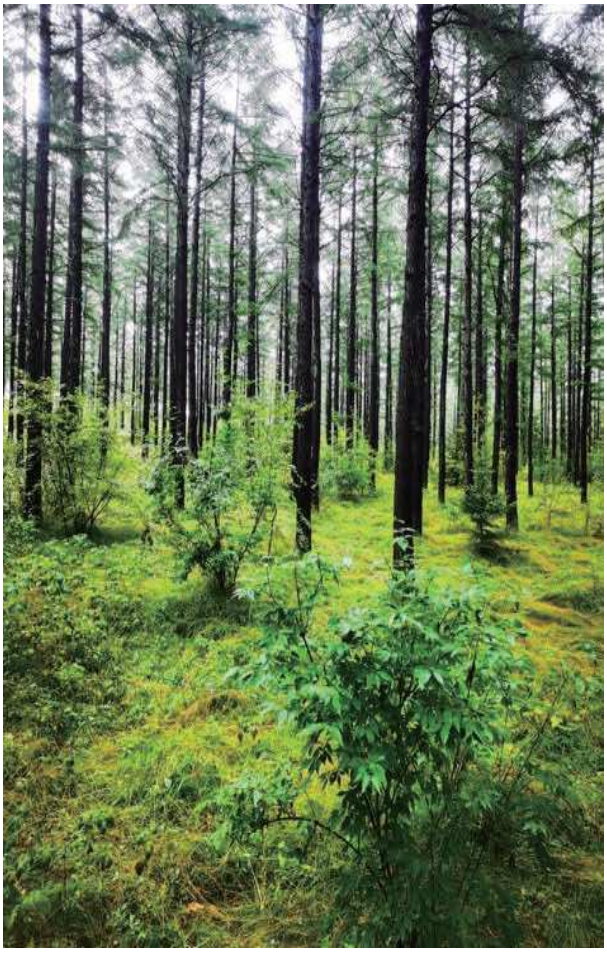
Afforestation effect

To further strengthen the conservation of the ecosystem and biodiversity, the Forest Farm has applied for and successfully established a national forest park and a national nature reserve, with a total operating area of 1.4 million mu, forming a solid Beijing-Tianjin-Hebei green barrier.

Main outcomes

(1) Ecological value

①According to calculation, the total value of the forest and wetland assets of Saihanba Mechanical Forest Farm can reach RMB 23.12 billion, the ecosystem service value provided by the forest and wetland reaches RMB 15.59 billion per year, and the total economic and ecological value of the Forest Farm can reach nearly 40 billion yuan. Among the ecosystem services provided by the forest and wetland ecosystem, each year it conserves 284×10^6 m^3 of water, prevents soil loss of $5.135,5\times10^6$ t, fixes 860,300 t of carbon dioxide, and releases 598,400 t of oxygen.



Three-dimensional resource structure

② One million mu of artificial forest in Saihanba has effectively blocked the southern invasion of the Hunshandake sand and built a solid green ecological barrier for the Beijing-Tianjin area.

③ The Forest Farm has become the habitat and shelter of 256 species of terrestrial vertebrates, 13 species of fish, 548 species of insects, and 625 species of plants and is one of the areas with rich biodiversity in Hebei Province.

(2)Social- economic value

①With a million mu of forest resources, the Saihanba Mechanical Forest Farm has promoted regional economic

development and led the people to get rich. Through village assistance, eco-tourism, and seedling production, it has provided a large number of jobs for local people, benefiting more than 40,000 people, and lifting 22,000 people out of poverty.

②The Forest Farm has provided technical support for other projects, pushing forward the large-scale afforestation of 4.45 million mu in the surrounding area, which has vigorously promoted the construction of ecological projects such as the Three-North Shelterbelt, the greening of Taihang Mountain, and the Millennium Forest in Xiong'an New Area.

③In December 2017, The Saihanba Mechanical Forest Farm won the "Champions of the Earth" awarded by the UNEP, and in October 2021, it won the "Land for Life Award" granted by the United Nations. Representatives of more than 30 countries from the United Nations Convention to Combat Desertification(UNCCD) have come to the Forest Farm to study afforestation, sand prevention and sand fixation techniques. The afforestation, sand prevention and sand fixation techniques of Saihanba Forest Farm have been promoted worldwide and gained a good international reputation.

(3) Innovation

Saihanba Mechanical Forest Farm has overcome technical problems such as the introduction of seeds, seedlings nurturing, and afforestation in alpine regions, and created techniques such as "three and a half-spades artificial gap seedling planting method", "seedling root dipping slurry water prevention method" and "overwintering afforestation seedlings covering soil for cold and wind protection method." It has achieved many scientific research results in engineering afforestation, forest management, desertification control, pest control, protection and utilization of wild animal and plant resources in high-altitude areas. The Saihanba Mechanical Forest Farm has explored and summarized the cyclic and orderly forest cultivation operation processes such as afforestation, tending, planting, pruning, thinning, main cutting, reforestation, etc., and compiled a set of forest management models suitable for the characteristics thereof, which played an exemplary role in national forest management and provided the Saihanba experience for global ecological governance.

About the applicant: Saihanba Mechanical Forest Farm, established in 1962, is a national nature reserve and national forest park, and an important water source for the two major water systems of Luanhe River and Liaohe River, with a total operating area of 1.4 million mu. The total value of forest assets is RMB 23.12 billion, and the annual value of ecosystem services is RMB 15.59 billion. Saihanba Mechanical Forest Farm has won "Champions of the Earth", "National Poverty Alleviation Model", "National Advanced Grassroots Party Organization" and other honors.

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Three Generations of Guardians in Jiuding Mountain of Sichuan Province

Maoxian Jiuding Mountain Wildlife Friends Association

Approaches: In-situ conservation; Public participation; Publicity & advocacy

Targets: Species diversity conservation; Flora; Mammals; Amphibians; Avifauna

Location: Jiuding Mountain, Mao County, Sichuan Province, China

Year of Implementation: 2004

Background

Jiuding Mountain is located in the middle of Longmen Mountain Ranges of Minshan Mountains, with the highest altitude of 4,989 m and an area of 200 km^2. It is the habitat of wild animals such as giant pandas, takins(*Budorcas tibetanus*), golden snub-nosed monkeys(*Rhinopithecus roxellana*), and black bears(*Ursus thibetanus*) . It is the main part of "Wolong—Siguniang Mountain Ecological Corridor for Pandas", and has been listed as a "World Natural Heritage Protected Area in Minshan Mountains" by Sichuan Provincial People's Government.

Snares dismantled during mountain patrol, the iron trap was used to trap bears and the noose were used to trap the national class-I protected animal — alpine musk deer

In the 1960s and 1970s, there were hundreds of thousands of wild animals in Jiuding Mountain. But after the land was contracted to households, poaching increased year by year. In some villages, there were about dozens of hunters every year engaging in

poaching with steel wire ropes, iron traps, shotguns, and hounds, resulting in endangerment and extinction of some species. In the 1990s, with the decrease of prey, some villagers set fire to burn large areas of forest, bush and grass meadow, forcing wild animals to escape from the forest and be hunted.

Main activities

Focusing on the protection of wild animals and plants, Maoxian Jiuding Mountain Wildlife Friends Association (the "Association") carries out activities such as anti-poaching, monitoring of ecology, training, and publicity as well as tree planting and afforestation in order to raise villagers' awareness of caring for the environment and protecting wild animals and plants, advocate law-abiding and promote the harmonious development between human and nature.

①Anti-poaching patrol. For each year, patrol twice from January to March mainly to protect wild animals foraging down the mountain, four times from April to June to fight against poachers impersonating villagers who dig herbs, three times from July to September in the east, south and north areas of Jiuding Mountain in a large area to clear the rubbish on the mountain, and twice from October to December to protect wild animals migrating to low altitude due to heavy snow sealing the mountain passes.

Mountain patrol team members bearing 30 kg per person, walking at 3,800 m above sea level to protect wild fauna and flora

Patrol team at an altitude of 3,600 m above sea level in Jiuding Mountain

②Restoration of vegetation. Over the past 20 years, under the organization of the Association, more than 2,000 mu of trees have been planted and the landslides in Chashan Village effectively controlled voluntarily by its members, villagers planted grass for more than 1,000 mu.

③Mountain-cleaning action. The Association regularly organizes villagers to collect garbage every year since its establishment, and more villagers joined in under their influence.

④Training and publicity. The Association has distributed more than 6,000 pieces of publicity materials on wildlife conservation via more than 10 campaigns. It has organized more than 40 training sessions for members of the Association, with total number of participations exceeding 1,600.The Association cooperated with many government authorities, public welfare institutions, enterprises, and

education organizations on nature. Its members have grown from 50 to more than 170, and participants in patrol have grown from one village to eight villages. It has developed from simple mountain patrol to remove snares to a richer and more comprehensive protection action, including patrol monitoring, counting the number of animals and plants, monitoring the ecological environment of animals and plants, training on photography of wildlife, and mountain cleaning activities.

Main outcomes

(1) Ecological value

From October, 2004 to August, 2021, the Association dismantled more than 130,000 wire rope traps and iron traps during annual mountain patrol activities. It has stopped many poaching activities, with more than 100 poachers arrested, among whom 4 poachers were sentenced, and 27 poaching guns expropriated. With the publicity of the Association, poachers are decreasing year by year, and vegetation is increasing. At present, the population of wild animals in Jiuding Mountain area has increased. The number of wild animals such as takin, giant panda, forest musk deer(*Moschus berezovskii*), alpine musk deer(*Moschus chrysogaster*), Himalayan goral(*Naemorhedus goral*), black bear, golden snub-nosed monkey, Chinese muntjac(*Muntiacus reevesi*), Chinese monal(*Lophophorus lhuysii*), and golden pheasant(*Chrysolophus pictus*) has increased year by year, and forest and grassland have been restored. The biodiversity of Jiuding Mountain is gradually being restored.

(2) Social- economic value

①Paid attention to local people's livelihood while planting trees voluntarily. In view of the landslide caused by the "5·12" earthquake, 40 km of mountain patrol roads and forest roads were repaired.

②In 2012, the Association won the"Outstanding Guardian Award" of China's Fourth 'Wildlife Guardian' Competition sponsored by WCS. And its founder, Yu Jiahua, became the first Chinese forest ranger to join the World Explorer Club.

About the applicant: Maoxian Jiuding Mountain Wildlife Friends Association was registered and established on October 14, 2004, and was divided into mountain patrol team and village environmental conservation team. With the protection of wild animals and plants as the core, the Association carries out ecological conservation activities such as anti-poaching, ecological monitoring, training and publicity, and afforestation. It improves the awareness of villagers in rural communities of caring for the ecological environment and wild animals and plants, and advocates law-abiding, building rural civilization and promoting the harmonious development between man and nature.

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Novartis China's Southwest Sichuan Forestry Carbon Sink, Community and Biodiversity Afforestation and Reforestation

Sichuan Dadu River Afforestation Bureau

Approaches: In-situ conservation; Sustainable use of biodiversity

Targets: Forest; Flora; Mammals; Amphibians; Avifauna

Location: Liangshan Yi Autonomous Prefecture in Sichuan Province, China

Year of Implementation: 2011

Background

Sichuan Liangshan Yi Autonomous Prefecture is located in the basin of the Jinsha River and the Dadu River in the upper reaches of the Yangtze River. As one of the 32 priority areas for biodiversity conservation in China, this region covers the priority area in the southern section of Hengduan Mountain which is the southern end home to giant pandas. Because of its remoteness, forest land resources in this area weren't utilized in a rational way,

Land degradation and soil erosion before afforestation in Pingqiao Village, Shenguozhuang Township, Yuexi County, Liangshan Prefecture, Sichuan Province

resulting in a sharp decline in forest resources, and haven't been effectively restored. In addition, land degradation in the project area is severe, most plots are in the state of rocky desertification, and soil erosion is severe as well.

Main activities

This Project, focusing on afforestation and reforestation for clean development, started in 2011 and lasted for 4 years. The Project, with a total investment of about RMB 100 million, built multifunctional artificial forests on the partially degraded land in 17 townships (towns) and 27 villages in counties of Ganluo, Yuexi, Zhaojue, Meigu, Leibo, and three provincial nature reserves including Maanshan at Ganluo, Shenguozhuang at Yuexi and Mamize at Leibo, in Liangshan Yi Autonomous Prefecture. Trees planted are all native species including Faber's fir(*Abies fabri*), dragon spruce, Chinese white pine (*Pinus armandii*), qimu(*Alnus cremastogyne*) sugi (*Cryptomeria japonica* var. *sinensis*), etc.

Chinese white pine forest planted in 2011 in Shishi'er Village, Shenguozhuang Township, Yuexi County, Liangshan Prefecture, Sichuan Province

Larch forest planted in 2015 in Shishier Village, Haitang Township, Ganluo County, Liangshan Prefecture, Sichuan Province

Objectives of the project are: ①Using native tree species to plant forests after scientific planning so as to mitigate the impact of climate change; ②Increasing the income of local communities and contributing to poverty reduction and alleviation; ③Strengthening the biodiversity conservation and the adaptability to climate change by improving the connectivity of the forest ecosystem landscape around the protected area; ④Improving the ecological environment, reducing soil loss caused by water erosion, and enhancing the soil and water conservation in the upper reaches of the Yangtze River; ⑤ Providing afforestation examples for forest plantation in other areas through scientific methods and mechanisms of carbon sink afforestation.

The crediting period of the project is 30 years (August 2011—July 2041) during which it is expected to reduce carbon dioxide emissions by 1.206×10^6 t.

Main outcomes

(1) Ecological value

①Biodiversity conservation. By restoring forest vegetation and enhancing forest connectivity, on the one hand, the habitat of local wild animals and plants was improved, the habitat of wild animals such as giant pandas and their migration corridors were expanded, and the survival ability of species was improved by promoting gene flow. On the other hand, it increased the income of residents in the reserve and surrounding communities, thus reducing the forest damage behaviors of community residents such as grazing, illegal logging and poaching.

②Control of soil loss caused by water erosion. Serious land degradation and soil loss caused by water erosion within the scope of the project directly threatened the nearby farmland and downstream rivers, and the restoration of forest vegetation will help to control soil loss caused by water erosion in this area.

③Other ecological services. The project will adjust hydrologic cycle, reduce the risk of drought and waterlogging, promote soil nutrient cycle, and improve local microclimate and other ecological environment.

(2) Social- economic value

①Create jobs. The project will create more than 934,000 workdays of temporary employment opportunities, mainly involving land preparation, planting, tending, thinning, forest management, and protection. During the crediting period of the project, 49 long-term jobs will be created. Local villagers will receive training in land protection, tree planting, forest management and protection and management.

②Increase community income. Covering a mountainous area inhabited by ethnic minorities which involves 17 townships (towns) and 27 administrative villages in five counties including Ganluo, the project has benefited 4,265 rural households, with a population of more than 18,000. Following the completion of the project, the average annual net income per capita will increase by about 13%.

(3) Innovation

This project uses forest carbon sinks to offset carbon footprint, fulfill corporate social responsibility and mitigate climate change.

About the applicant: Sichuan Dadu River Afforestation Bureau is one of the 28 key forestry enterprises implementing the natural forest resources protection project in Sichuan, specializing in afforestation, closing hillsides to facilitate afforestation, forest management and protection, seedling cultivation, etc., and has rich technical experience in seedling raising, afforestation and forest management. In more than 50 counties of 16 cities(prefectures), such as Liangshan Prefecture, Ganzi Prefecture and Leshan City, in Sichuan Province, it has completed a total of 1.55 million mu of artificial afforestation, 1.08 million mu of aerial seeding afforestation, 3.6 million mu of afforestation by closing hillsides, and 910,000 mu of forest tending, managing and protecting 9 million mu of forest all the year round.

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Sustainable Land-trust Nature Reserves

Paradise International Foundation

Approach: In-situ conservation

Targets: Forest; Freshwater and wetland

Location: Old Creek in Pingwu County of Sichuan Province; Bayuelin of Sichuan Province; Xianghai of Jilin Province; Jiulongfeng of Anhui Province; Taiyangping of Hubei Province; and Jiangshan Xueling of Zhejiang Province, China

Year of Implementation: 2011

Background

After more than 60 years' effort, China has established nearly 12,000 nature reserves of various functions, which have played an important role in the conservation of biodiversity. However, the demand for nature conservation is still huge, so it needs the input of all sectors of society.

Main activities

Paradise International Foundation(hereinafter , the "Paradise Foundation") tries to promote a type of sustainable"land-trust Nature Reserve" that is authorized and supervised by the government, funded by society, managed by nonprofit organizations, and coordinated with community development. Land-trust Nature Reserves have the following characteristics:

①Authorized and supervised by the government, and managed by private institutions to achieve long-term ecological conservation goals;

②Focus on the three basic areas of patrol, community, and facility management, and introduce LoTs (Internet of Things) and AI technology to create intelligent system for patrolling reserves to improve the management effect;

③Establish expansion areas in the communities surrounding the reserve and incorporate them into the scope of the reserve for routine management;

Watching sea of clouds at the highest peak of the Old Creek

④Guide communities to develop eco-friendly industries in the expansion area, and set up protection zones/community reserves to carry out protection actions spontaneously;

⑤Establish star grade ranger system , a career ladder for employees' growth.

In 2011, the first land-trust Nature Reserve(NR) was established in the Old Creek in Pingwu County of Sichuan Province. Ten years later, wild animals such as giant pandas and takins appeared frequently. Nearly half of the villagers in the community participated in the ecological agricultural products program, and the average household income increased by RMB10,000.

Subsequently, the Paradise duplicated the Old Creek model in areas such as Bayuelin NR of Sichuan Province, Xianghai National NR of Jilin Province, Jiulongfeng Provincial of Anhui Province, Taiyangping land-trust NR of Hubei Province, and Xueling land-trust NR of Zhejiang Province. Currently, the protection area covers more than 600 km^2, with more than 80 frontline protection employees and the accumulated patrol mileage surpassing 150,000 km.

Main outcomes

(1) Ecological value

The Paradise Foundation established expansion areas in the surrounding communities of the reserve, and incorporated the community work in the expansion areas into the daily work of the reserve. The 6 land-trust Nature Reserves managed by the Paradise Foundation are of high protection value, covering ecosystems like subtropical evergreen broad-leaf forest, and temperate dunes and grass

swamp, protecting wildlife like giant pandas, black muntjac (*Muntiacus crinifrons*), Elliot's pheasant (*Syrmaticus ellioti*), dove tree (*Davidia involucrata*), and Chinese yew(*Taxus wallichiana var. chinensis*) .

(2) Social-economic value

In 2013, the Paradise Foundation started to promote development and poverty alleviation in Minzhu Village in the expansion areas of the Old Creek Reserve. More than 170 households have been benefited, and the average annual income of participating households has increased by more than RMB 10,000. It also promoted the establishment of community reserves in Xinyi Village and Fushou Village bordering the Reserve, which increased the protection area around the Old Creek by nearly 100 km^2. The Paradise mobilized the member enterprises to establish a public welfare base for long-term community support, and arranged team-building and nature education activities. In Jiulongfeng, it drove the development of more than 230 households, doubling the tea sales of tea farmers, and established the farmer's cooperatives with more than 10 participating households, raising the average annual household income by RMB 18,000. In Bayuelin, it helped farmers increase the annual income from tea sales by more than RMB 400,000. In Xianghai Reserve, it promoted the production of miscellaneous grains by more than 30,000 kg. And in Taiyangping, it helped farmers sell 2,000 kg of honey, benefiting more than 20 households.

From 2018 to 2020, the member enterprise Joincare Pharmaceutical was introduced to help the communities around the Old Creek, Xianghai, and Jiulongfeng alleviate poverty by treating chronic diseases, with an investment of RMB 5 million, benefiting nearly 2,000 villagers.

The nature education tour "Nature Guardian" developed by the Paradise Foundation in the reserve brought concrete income to the communities around the reserve and promoted the sales of ecological agricultural products here. From 2019 to 2020, more than 2,000 people participated in the "Nature Guardian" research activities.

(3) Innovation

①Innovation of public welfare products: Public welfare products such as land-trust Nature Reserves are favored by public welfare organizations and philanthropists because they are easy to understand and measure.

② Management innovation: Integration of supervision by government and management by social institutions allows social forces to help the government manage reserves; so as to balance the development of the community and

Short-distance patrol in Jiulongfeng Reserve

Community interview in Bayuelin Reserve

Community interview in Taiyangping Reserve

reserve conservation, and strive to become a good neighbor of the community; build the reserve into a platform for public welfare activities, introduce external forces to help the reserve carry out the work and assist the community in poverty alleviation and development.

③Technology innovation: Realized effective management of reserves by developing an intelligent patrol system using the technology of IoTs; developed an intelligent recognition system using AI technology, and its accuracy of recognizing animal photos taken by infrared cameras exceeded 95%, greatly reducing the monitoring pressure.

④ Policy innovation: In Xueling, Jiangshan City, Zhejiang Province, use the easement model to promote the establishment of the reserve, and the easement registration certificate for ecological conservation has been obtained.

About the applicant: Paradise International Foundation is a non-profit environmental conservation organization that pays attention to the establishment and management of land trust Nature Reserves, and is committed to protecting the pure land we care about with public welfare mentality, scientific means and commercial means. The Paradise, through cooperation with the government, has managed six land-trust Nature Reserves in five provinces of China, covering an area of over 600 km^2.

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Urban Green Space — Peking University's Yanyuan Nature Reserve

Center for Nature and Society, Peking University

Approaches: In-situ conservation; Public participation

Targets: Urban; Flora; Mammals; Amphibians; Avifauna; Freshwater creatures

Location: Yanyuan campus of Peking University, Beijing, China

Year of Implementation: 2009

Background

The Yanyuan campus of Peking University upholds the traditional Chinese garden design concept "learn from nature". It not only provides a beautiful learning and working environment for students and staff members at Peking University but also becomes an important carrier of the spirit of Peking University, and has extremely important value in the conservation of biodiversity. Yanyuan has retained its natural landscape and features a complete plant community. It also has various types of water bodies, which provides a miniature landscape with almost all types of wetlands in the East Asian plains, thereby preserving the native biodiversity of the eastern plains of China, making Yanyuan a green island suitable for harmonious coexistence between human and nature in the busy city like Beijing.

Aerial view of Yanyuan campus

Main activities

Since 2002, nature lovers amongst students and staff members of Peking University have begun to investigate birds, fish, mammals, insects, and plants that live in Yanyuan. In 2009, with the assistance and under the guidance of teachers and students from Peking University's Center for Nature and Society, student members from the Peking University Green Life Association systematically monitored and patrolled bird and plant phenology on the campus, which has lasted to date. Currently, there are more than 230 species of birds, more than 600 species of higher plants, 11 species of mammals, 26 species of fish, 11 species of amphibians and reptiles, 27 species of butterflies, and 26 species of dragonflies, that have been recorded on the campus of Peking University, among which, there are 4 species of animals under Class-Ⅰ conservation by the Chinese government, 32 species of animals under Class-Ⅱ conservation by the Chinese government, one species under the CR category and 1 species under the EN category on the IUCN Red List, and 5 species under the VU on the IUCN Red List, making the campus of Peking University one of the urban green spaces with the most abundant native flora and fauna in China.

Under the long-term promotion of Peking University's students and staff members, Peking University established the Yanyuan Nature Reserve. The Reserve covers all the historical garden areas on the north side of the campus, as well as some areas in the south of the campus and outside the west gate of the University, totaling 50 hm^2. This is the first nature reserve established in a Chinese university and the first nature reserve in Beijing. As the initiator, Peking University Center for Nature and Society has formulated a series of management plans, in which delineating and enclosing an explicit area for biodiversity conservation. detailed management measures that are different from traditional urban green space management methods for managing habitats of important species, such as water bodies, woodlands, and large trees ; preserving the near-natural restoration of multi-ple native vegetation species;and incorporating upholding biodiversity monitoring in the long run into the reserve management plan.

A grey heron (*Ardea cinerea)* is preying on a fish

Main outcomes

(1) Ecological value

In to the current large-scale urbanization process in China, biodiversity conservation faces many challenges, and habitat loss and habitat fragmentation are two of the most important reasons. Compared with urban green spaces in other cities, the "Three Hills and Five Gardens" area where the Peking University campus is located is a biodiversity hotspot in the urban area of Beijing. Therefore, this campus of only 1 km² provides a habitat of high urban biodiversity conservation value.

(2) Social- economic value

In the construction of the Nature Reserve, Peking University's students and staff members are the main implementers. They use the Nature Reserve as a platform and place to encourage students to engage themselves in monitoring and management of biodiversity conversation in various forms. This will help

Some teachers, students and visitors are attracted by a grey heron preying on a ornamental fish

students understand nature and ecology by actively working in nature and an ecological system, so as to cultivate the concept of cherishing life and understanding nature on campus and the atmosphere for everyone to participate in campus protection, allow visitors who visit the campus to learn about the knowledge and ideas of nature conservation.

In the aspect of institution, a management system that allows scientific research institutions, student associations, and the University's gardening, planning, security, logistics, and other functional departments to work together is established, elevating Peking University's campus management capabilities to a new level. Besides, the management experience and methods can play a demonstrative role for other urban green space management projects, which is an effective way for Peking University to deliver on its social responsibilities and to serve the society.

(3) Innovation

①Management innovation. Against the background of urbanization, teachers and students on the campus engage themselves in the project for a quite long period of time and work together with the University's management department to protect the precious urban habitat and explore the mode for the harmonious coexistence between man and nature. This kind of work and management method is of certain innovative significance.

②Teaching innovation. A number of Peking University carry out biodiversity monitoring on the campus in combination of undergraduate teaching, to study the response of urban green space biological groups to artificial disturbances and protection methods again artificial influences,in the hope of making breakthroughs in research and talent cultivation in macro biology and ecology in the future. In addition, helping students to develop ecological ethics, and guiding students to think creatively about how to realize ecological civilization by providing more ecological monitoring practice opportunities in university education is an innovative teaching method of great significance.

About the applicant: Peking University Center for Nature and Society was founded in 2008, with Professor Lyu Zhi as its executive director. The team of the Research Center led by Professor Lyu Zhi has long been conducting ecological and conservation biology research on endangered flagship species in the mountains of southwest China and the Qinghai-Tibet Plateau, and observing the relationship between species, trophic cascade and interactions between nature and human beings. The team pays attention to the comprehensive discipline issues urgently needed for conservation, and provides first-hand evidence based on field research for conservation decision-making. In the past 30 years, this research team has cultivated a group of ecologists and conservation practitioners with ideal and practical spirit in the field of nature conservation in China.

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Beijing High-density Urban Community Biodiversity Conservation

Beijing Evergreen Institute

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Sustainable use of biodiversity

Targets: Urban; Flora; Amphibians; Avifauna; Others

Location: Xinjiekou Street in Xicheng District and Zhongguancun Street in Haidian District of Beijing, China

Year of Implementation: 2012

Background

At present, major strategies on promoting the balance between economic development and ecological conservation, and on strengthening biodiversity conservation have been introduced one after another, and the public's ecological awareness has been continuously improved, particularly in the post-pandemic era, where people are increasingly concerned about the relationship between human settlements and nature ecology, which requires the intervention, organization and guidance of professional teams to lead, through publicity and education, urban residents to pay attention to the natural environment and sustainable development of cities and participate in biodiversity conservation actions.

Main activities

Beijing Evergreen Institute(hereinafter "Evergreen Institute") aims at guiding the people living in old traditional communities and emerging high-rise communities in Xinjiekou Street in Xicheng District and Zhongguancun Street in Haidian District of Beijing to participate in biodiversity conservation actions in urban human Living environment.

After illegal buildings were demolished, using comprehensive methods such as garbage

Spring landscape of imitating the natural community in a small garden: based on the ecological principle, herbaceous plants are combined by imitating nature, forming a community planting design featuring organic and stable development

composting, soil restoration, "neo-naturalism" plant community planting, and small-scale creature habitat creation, and many other methods, restored 400-square-meter ecosystem and built a community ecological education demonstration base.

Improved the quality of the existing green space in the communities, and promoted measures such as roof greening, and household planting and ecological facility installation.Developed integrated community-based online and offline environmental education platform and curriculum.

Established a team of 50 environmental conservation volunteers consisting mainly of housewives and children; established a community self-organized and sustainable communication platform.

In the two communities where the project is implemented, at least 100 community workers have received professional knowledge training related to ecological communities, and the community residents have adopted a more eco-friendly lifestyle under their influence.Investigated public awareness of urban biodiversity conservation.

Cooperated with Beijing Forestry University, Beijing Municipal Research Institute of Eco-Environmental Protection,and other scientific research teams to observe the dynamic changes of biodiversity and introduce environmental science research into community management.

Summarized and promoted the model of community members' participation in biodiversity conservation.

The Project has been selected into the United Nations Development Program (UNDP) Global Environment Facility Small Grants Program(GEF SGP), and it marks the implementation of the World Conservation Congress's proposal "The Role of Children and Youth in Nature Conservation" in China.

Main outcomes

(1) Ecological value

①Through public participation in urban environmental restoration, the biodiversity level of the demonstration communities has been improved, with the number of native plants in the community

increasing by more than 30 species, and the number of animals by more than 50%.

②The area and connectivity of green space in the demonstration communities have been significantly improved. An additional roof area of about 500 m^2 has been greened, and more than 50 households increased the number of plants in their homes.

③A replicable curriculum package on biodiversity has been produced, and regularly taught in the communities or surrounding schools, successfully combining textbook knowledge with biodiversity conservation practices.

(2) Social-economic value

①Comprehensive activities such as training for capacity building, environmental education, exhibitions, etc. were carried out at community environmental education bases and other places, which improved the community residents' understanding of urban biodiversity and drove more residents to participate in urban ecological conservation.

②The project has made community residents, especially teenagers and young children, more actively engage in biodiversity conservation, strengthen their sense of community responsibility and consolidate the sense of community cohesion, enabled residents to get to know each other and work together for a better community and urban environment.

Parents and their children of families in the community are planting mimical nature herbal communities

Led by the project team, the students of Shuangyushu Central Primary School is planting and maintaining vegetation in the street; by this way, the school is engaged in the management of community green space

③ The project provided a series of comprehensive solutions for public participation in biodiversity conservation in sustainable urban communities, and cooperated with government authorities to allow the experience to be promoted and adopted in other communities.

(3) Innovation

①In the publicity, mobilization, implementation, and follow-up stages of the Project, the need for public participation was emphasized. In China, women and children are the core of the families. Through the participation of women and children, it is possible to mobilize other family members to participate in the project.

②By combining the use of online and offline methods, the project developed a mini-program to be used for online exploration, which can be promoted. Besides, the project set up check-in points at designated locations in the community, so that community residents can learn while playing the game. The introduction of online platform not only increased interestingness, but also provided more knowledge.

③The project promoted the cooperation among stakeholders of the community, which was in line with the current government's community development concept of self-governance and multi-party governance. After the third-party social organizations withdrew from the project, the community can still maintain operations through the developed social group and management department.

About the applicant: Beijing Evergreen Institute was registered and established in 2012, and was rated as a A social organization in 2015. The Center established the vision of "building a child-friendly, environmentally-friendly and good-neighborly" community, and promoted the environment-friendly community development by means of nature enlightenment, community practice and ecological citizenship.

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Wetland Ecological Restoration and Waste Management of Laoshi Village, Danzhou City, Hainan Province

Blue Ribbon Ocean Conservation Association

Approaches: In-situ conservation; Public participation

Targets: Ocean and coastal; Freshwater and wetland; Flora

Location: Laoshi Village, Haitou Town, Danzhou City, Hainan Province

Year of Implementation: 2019

Background

Surrounded by the Zhubi River, Laoshi Village, Haitou Town, Danzhou City, Hainan Province is located in a typical estuary where rivers and marine ecosystems intersect, forming an important habitat for various aquatic animals. According to the *Dan County Chronicles*, it used to be the political, economic, and cultural center of Haitou Town during the Qing Dynasty. Salt fields had been the pillar industry in its economy for generations. In 1990, a seafood company came here to contract and lease the site in the village for shrimp farming. Later the company went bankrupt terminated the lease, leaving the shrimp ponds in the village idle. The original salt fields and wetland ecosystem in the village were damaged during shrimp farming, and some unmanaged waste ended up in the Zhubi River and further into the Beibu Gulf, causing coastal ecological damage. There are now about 280 permanent residents in the village. Due to the lack of professional skills and economic industries, to make a living, most villagers have migrated to urban areas in search of work, and their awareness of environmental conservation was weak.

Main activities

Since 2019, Blue Ribbon Ocean Conservation Association has organized and implemented wetland ecological restoration and waste control actions in Laoshi Village.

Mangrove restoration

①Implemented scientific restoration of mangrove habitat. Invited ecological wetland conservation experts to conduct habitat survey on the project site, formulated an overall wetland restoration plan, and carried out a pilot project for comprehensive restoration of 1,500 m^2 of mangrove wetland.

②Explored the "community ecological economy". Built experimental farms for ecological farming, explored opportunities for developing the community's ecological economy, and transformed from "investing money to improve ecology' to "using ecology to earn a livelihood". Selected leaders to be in charge of ecological farming and invited farming experts to assist in scientific farming.

③Mobilized the internal drive of the community and promoted the environmental governance mechanism transition from "being asked to do" to "offering to do", and organized villagers to carry out environmental governance actions, to remove the accumulated waste and reduce land-based pollution: set up a project management committee to encourage the villagers to take the initiative in cleaning up and maintaining the environment; regarding riverside waste, organized marine waste cleaning actions regularly to reduce the amount of unmanaged waste entering into the sea.

④Empowered communities to develop skills for making a living according to the particular characteristics of the local ecological environment and implemented rural revitalization measures. Set up villager empowerment class, invited experts to guide, and give technical training: raise villagers' awareness of marine protection, conducted publicity and training on trash sorting, marine waste pollution prevention and control, tried to promote rural waste management, and help the prevention and control of land-based pollution in Laoshi Village; in combination with the municipal government's plan for the renovation of abandoned shrimp ponds and ecological restoration, invited experts to provide guidance and support for ecological farming, and organize farming representatives to study in the pilot areas with mature technology and replicable models; invited technical experts to carry out waste sorting

training, with women as the main audience, to reduce waste produced at homes and train women to become the leading force in social supervision.

Main outcomes

(1) Ecological value

①Implemented 1,500 m^2 of wetland habitat restoration at the estuary of the Zhubi River Basin, and explored the restoration of wetland ecology and biodiversity of benthos at the estuary.

②Investigated the local mangrove wetland and its surrounding biodiversity and formulated recommendations on the types of mangroves and restoration areas suitable for the Zhubi River Basin, providing data support for the government's million RMB restoration project.

③Promoted the transition from traditional farming industry to ecological farming and reduced wetland ecological pollution.

(2) Social- economic value

①Enhanced local villagers' marine environment conservation awareness, and promoted the establishment of a rural waste sorting mechanism.

Community empowerment—nature guide training

Blue Ribbon's mission "Marine ecology protection and harmonious symbiosis between human and sea"

②Set up a project management committee to organize the members to participate in training and took the initiative in organizing related activities, so as to enhance villagers' ability to conduct community affairs.

③Cooperated in the implementation of the government's million- RMB ecological restoration project. Implemented background investigation, wetland restoration, mangrove restoration pilot area, etc., for the project, attracted the project being officially implemented, and increased the investment amount from hundreds of thousands of RMB to RMB 7 million.

④Enhanced the visibility of the project site. Gained attentions of experts in all relevant fields and other social organizations to the project site, and promoted social organizations to reach certain cooperation agreements with the project site.

(3) Innovation

①Guided project site to focus on a brand-new ecological field mangrove wetland ecosystem.

②Carried out pilot ecological farming in abandoned shrimp ponds and test for restoring the mangrove wetland ecosystem in Zhubi River Basin.

③Established a project management committee. Promoted villagers to participate in project co-management and take the initiative to promote project progress.

About the applicant: Blue Ribbon Ocean Conservation Association is committed to building a global and open public welfare ecological platform for ocean conservation. Since its establishment on June 1, 2007, continuously carried out marine ecological resources conservation, marine pollution monitoring and governance, marine ecological science popularization, marine conservation network development and other work all over the country, with a number of brand projects gradually taking shape, such as coastline supervision and governance, marine guardian, mangrove conservation, community based environmental conservation , and fishery community environment improvement.

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Save the Spoon-billed Sandpiper

Mangrove Wetlands Conservation Foundation

Approach: In-situ conservation; Public participation; Publicity & advocacy; Financial support mechanisms; Sustainable use of biodiversity

Targets: Ocean and coastal; Freshwater and wetland; Flora; Avifauna; Marine creatures

Location: Zhanjiang of Guangdong Province and Tiaozini in Yancheng City of Jiangsu Province, China

Year of Implementation: 2018

Background

Birds, as the main indicator biological group of coastal ecosystems, are the focus of coastal wetland conservation. Among them, the number of migrating waterbirds in the EAAF is declining sharply at a rate of 5%~9% per year, making EAAF the migratory area with the grimmest conservation condition in the world. The spoon-billed sandpiper(*Calidris pygmaea*) is one of the most endangered and rare birds on the planet, and it is also a flagship species of EAAF coastal wetland conservation, with great conservation and symbolic significance.

Main activities

Through scientific conservation and education, the project adopted adaptive management ways to promote systemic changes, with a view of reducing or mitigating the major threats faced by EAAF migratory waterbirds and their habitats, and improving the quality of 3 to 5 key habitats, as well as curbing the global decline in the number of spoon-billed sandpipers.

①Through scientific research, monitoring and database development, provided scientific basis for protection project design, rapid response to threats to habitats, and policy advocacy. The project supported the research of migratory waterbirds represented by the spoon-billed sandpiper, such as the collection of bird flag information, supported the research on the population dynamics, migration, and reproductive ecology of waterbirds in the migratory area, investigated and researched into the food resources of the

Spoon-billed sandpipe
(Li Dongming/Photographer)

shorebirds in coastal mud flat in China and assessed the habitat quality of coastal wetlands.

②Improved the quality of key habitats (Zhanjiang and Tiaozini) of spoon-billed sandpipers . Promoted the exploration of local socialized protection models, particularly for key issues in wetland protection and management, such as the management and effectiveness evaluation of the invasive species smooth cordgrass, the construction of the high tide habitats for shorebirds, ecological monitoring, etc., and implemented cooperative actions.

③Carried out international cooperation to support the research and into protection of the breeding places and wintering places of spoon-billed sandpiper. Kept close contact with international scientific research institutions concerned about spoon-billed sandpiper, such as supporting the breeding places in Chukotka of Russia to carry out related work including artificial breeding of spoon-billed sandpipers and control of predators supporting the ecological monitoring and community conservation action in the main wintering places in Myanmar to promote and implement spoon-billed sandpiper conservation actions across the migratory area.

④Through the Spoon-billed Sandpiper Conservation Alliance, the project integrated relevant government departments, reserves, social organizations, enterprises, and other resources and formed a united front to jointly protect migratory birds in migratory areas and major habitats of migratory birds.

⑤Promoted the public welfare cooperation on the "Spoon-billed Sandpiper Global Guardian Ambassador" and significantly increased the public's knowledge of spoon-billed sandpipers through the cooperation.

Main outcomes

(1) Ecological value

①Saved the endangered species of spoon-billed sandpiper. This project directly increased the bird population by supporting artificial breeding and predator control in the breeding areas of spoon-billed sandpipers.

②Protected the habitats of the species. The project has taken effective actions against direct threats to the habitats. For example, through the cooperation with Zhanjiang Nature Reserve, more than 20 hm^2 of smooth cordgrass were effectively managed, and the evaluation of cleanup control also confirmed the importance of invasive species control for birds living on mangroves.

③ Protected the wetland ecosystem. Through the effort in habitat improvement, species conservation, and nature education, the overall biodiversity of the local wetland has been improved, and the service value of the wetland ecosystem has been enhanced.

(2) Social-economic value

①By assisting Tiaozini habitat in formulating and implementing the implementation rules for

managing the 720 mu of high-tide habitat, the project helped protect the local biodiversity and ecological environment to a great extent. The "720mu" was hailed as a "Chinese sample" in exploring ways for ecological restoration of natural heritage by the CCTV and other media.

Spoon-billed sandpiper
(Li Dongming/Photographer)

②Through promoting diversified CEPA (communication, education, public participation and awareness promotion) activities, project provided the public with a field to interact with wildlife and environmental conservation information and knowledge, so as to achieve the wise use of wetlands.

③Through the public welfare cooperation with the "Spoon-billed Sandpiper Global Guardian Ambassador", the environmental conservation topic that require public attention were brought into the view of the public.

(3) Innovation

①Innovation of model. The project adopted a participation model with aggregated social resources, and promoted diversified and effective management. This model of combining government responsibility, social coordination, and public participation has changed the situation in which multiple social actors can only passively participate in conservation actions in the past, and successfully enabled everyone to actively participate in conservation actions and become co-governors influencing the decision-making and implementation of conservation actions.

②Integration of scientific research and wetland management. Using cutting-edge bird tracking technology, especially the precise positioning of small fields, the project carried out wetland restoration impact evaluation based on ecosystem structure and functions, effectively evaluated the effectiveness of restoration, and applied the evaluation results to the refined and adaptive management of wetlands, improving the resilience and adaptability of field management.

About the applicant: Mangrove Wetlands Conservation Foundation (MCF) is China's first environmental conservation foundation raising funds from the general public and initiated by a social organization. It is committed to protecting wetlands and their biodiversity, and practicing the nature conservation model with social participation. In July 2012, the Foundation was initiated by the Society of Entrepreneurs and Ecology, entrepreneurs who are keen on public welfare and relevant departments in Shenzhen.

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Regenerative Seaweed Production Linked to iMPA

Coast 4C Limited

Approaches: In-situ conservation; Public participation; Financial support mechanisms; Sustainable use of biodiversity; Access and benefit-sharing of genetic resources

Targets: Ocean and coastal

Location: Philippines

Year of Implementation: 2020

Background

Seaweed farming of Eucheumatoid seaweeds is responsible for around 30% of fisheries production in the Philippines. Eucheumatoid seaweeds are the world's most cultivated seaweeds. Recent technological advances are opening new and exciting markets for these seaweeds, including green biorefinery technology close to source that allows these seaweeds to act as the seedstock for bioplastics, biofertilisers, feed and food. Farming of Eucheumatoid seaweeds has been promoted by social organizations and governments for over 4 decades as an alternative to overfishing, unsustainable and illegal fishing. However, seaweed farming has in fact had a detrimental impact on marine biodiversity due to convoluted and opaque value chains, lack of proper support services(including financial and technical services) for seaweed farmers who rely on outdated seaweed strains and practices that are no longer fit for purpose in the context of climate change. As a result, seaweed farming now accounts for around 50% of marine plastic pollution contributed by small-scale fishing communities. Coast 4C① has been able to address these issues by integrating seaweed farming with iMPAs.

Main activities

Coast 4C integrates regenerative seaweed farming with larger and more effective community-based marine protected areas (MPAs), in a model that Coast 4C co-developed with coastal

① 4C: Community, Conservation, Commerce, Climate.

communities and has co-branded "iMPA" where the "i" stands for a range of values identified as important to the communities and to the team: innovative, integrated, inclusive, improved. iMPAs are 45 times larger than the average MPA size in the Philippines and are underpinned by a sustainable business model.

①Establishment of strong and inclusive social infrastructure linked to social marketing tools that increases participation in the whole process;

②Broadening out MPAs from being focused on coral habitat to incorporating habitats from mangroves through to deeper water areas beyond the reefs;

③Integrating appropriately sited ecological seaweed farming zones that both reduce impacts on sensitive habitats and provide a safe and healthy space for growing seaweed;

④Integrating concepts of Territorial User Rights in Fisheries(TURFs) within sustainable use zones to incentivize community enforcement and compliance;

⑤Supporting small-scale fishers to adopt ecological seaweed farming methods that increase their yields, reduce risk and offer them a price premium contingent on meeting social and environmental criteria (including iMPA performance) to offset the opportunity costs of larger iMPAs;

⑥Underpinning the iMPA with a sustainable business model that is based on trading of regenerative seaweed;

⑦Integrating plastics reduction and recycling strategies, including buying end-of-life Nylon 6 fishing nets that are sold for recycling;

⑧Working closely with local government and increasing capacity to support iMPA

Coast 4C integrates regenerative seaweed within larger and more effective community-based marine protected areas, branded as "iMPAs"(Amado Blanco/Photographer)

Coast 4C works with seaweed farmers to ensure that their practices are sustainable and generate positive social and environmental outcomes (Amado Blanco /Photographer)

implementation.

Coast 4C provides access to appropriate financial services, including through the use of the proven Village Savings and Loan Association model that was developed by CARE and is now used by major development organisations to deliver financial services to over 20 million people in 77 countries.

Coast 4C aggregate farmers through a large and growing network, and process seaweed locally for sale to responsible global markets with traceability.

Main outcomes

(1) Ecological value

To date project has diverted 297 million metres of end-of-life fishing net from the ocean for recycling, and reduced coastal plastic pollution by an estimated 40%. By integrating seaweed into iMPAs, project has been able to undertake proper spatial planning and ensure they are sited away from sensitive habitats such as corals and seagrasses. Increasing the production of regenerative seaweed within iMPAs also helps to locally reduce ocean acidification and deoxygenation that results from climate

Coast 4C provides training and input support to small-scale fishers to allow them to scale-up their regenerative seaweed farming practices (Amado Blanco /Photographer)

change, reduces eutrophication from coastal run-off, and therefore helps habitats within the iMPA recover. Finally, seaweed farms within iMPAs provides a physical barrier to reduce illegal fishing, and also incentivises community presence within the iMPA and enforcement to reduce theft and also the impact of destructive fishing practices like poison fishing that can also kill seaweed.

(2) Social- economic value

To date project has provided financial services to 3,946 households who have saved about USD408,000 over 9 years. 83% of the members of these Village Savings and Loan Associations (VSLAs) are female. Through shortening the value chain and providing price premiums, project has generated about USD127,000 of community income to date. 66% of the people the project trained in regenerative seaweed practices are female. Female representation in MPA Management Councils increased from 21% to 34%.

By shortening the value chain, processing close to source, developing new processing technologies and access to new markets, and offering price premiums, project is increasing the community share of the value chain for seaweed and also for plastics recycling.

4 million people in small-scale fishing communities in the Coral Triangle already depend on seaweed farming, 1 million of which are in the Philippines. Coast 4C aims to halving the poverty rate(from 26.2%) in targeted small-scale fishing communities within 3 years.

(3) Innovation

①The integration of regenerative seaweed into marine protected areas both from a practical perspective to provide a safe and healthy space for seaweed farming, and also to provide a new and sustainable business model to underpin MPAs.

②The design of inclusive value chain, create cooperatives within communities so that they can undertake quality control and the first stages of trading and processing, keeping as much of the value as possible local and reducing transaction costs; aggregate large numbers of people in the value chain and pass on a price premium; leverage traceable supply chain technology to increase efficiencies.

③The development of locally appropriate technology such as baling machines that reduce costs, increase transport efficiencies, and therefore increase price; a containerized green biorefinery technology that allows people to process seaweed locally for multiple markets and make use of 100% of the seaweed biomass.

About the applicant: Coast 4C is a social enterprise with a mission is to build vibrant and resilient blue economies in marginalized coastal areas, and its aim is to empower 22 million small-scale fishers to restore the ocean. Coast 4C is integrating the world's largest supply of regenerative seaweed to benefit the 4C of Community, Conservation, Commerce and Climate.

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Fish Forever

Rare

Approaches: In-situ conservation; Public participation; Policy-making & implementation; Financial support mechanisms; Technological innovation;Sustainable use of biodiversity

Targets: Ocean and coastal; Marine creatures

Location: Indonesia, Philippines, Brazil

Year of Implementation: 2021

Background

Coastal seas contain rich marine biodiversity .

40% of the world's population lives within 100 kilometers of the sea. The proximity of people and nature means that coastal communities are at the center of both the cause and the solution to environmental problems.

Coastal villages depend on local fisheries for food and employment, coral reefs protect their shores from erosion and wave damage, ecosystems like mangrove forests and seagrass beds support an unparalleled richness of biodiversity and the wellbeing of tens of thousands of rural communities.

Coastal ecosystems are facing unprecedented threats. Unsustainable fishing, exacerbated by habitat destruction and the effects of climate change, is changing the ecology of our oceans. About half of the world's coral reefs have already been lost, more than 35% of mangroves have been deforested and a third of the world's fisheries are overfished. And now a negative feedback loop has developed: overfishing reduces habitat quality, and degraded habitats support fewer fish. Trapped in the vortex of this downward spiral and unable to see other options, fishers increase fishing effort and adopt ever more destructive fishing methods to maintain their catches. This behavior places even more pressure on the ecosystem, causing a race to the bottom of diminishing returns.

Main activities

Launched in 2012, Fish Forever is the first global effort delivering a replicable model to reverse overfishing, protect biodiversity, and safeguard the prosperity of coastal communities. By linking the protection of critical habitat with a community's exclusive rights to fish in surrounding waters, Fish Forever builds clear incentives to replace destructive competition with effective coordination, where communities receive measurable benefits from protecting critical marine habitats and managing their local fisheries.

Fish Forever aims to delivering lasting change across the coastal zone of eight priority countries where globally significant biodiversity intersects with high dependence on local fisheries for food security and rural livelihoods. To achieve this, Fish Forever partners with local communities and governments to:

①Establish managed access areas that provide fishing communities clear rights to fish in certain areas.

②Create networks of fully-protected and community-led no-take marine reserves to replenish and sustain fish populations and protect critical habitat.

③ Build community engagement and effective management bodies to support local decision-making.

④Enable fishers to adopt more sustainable and better-regulated fishing behaviors(for example, become a registered fisher; record fish catch; respect fishing regulations; and participate in fisheries management) .

⑤Collect, disseminate, and help fishing communities use data for decision-making.

⑥Advance coastal fishing communities' inclusion in financial and market opportunities to increase household resilience.

⑦Mobilize public and private investment in coastal fisheries and marine natural resources.

⑧Enact policy to promote and sustain a community-based management approach.

Main outcomes

(1) Ecological value

Fish Forever's Managed Access with Reserves(MA+R) approach undertakes a participatory, inclusive approach with local stakeholders to design, establish, and enforce managed access areas open to fishing activity and marine reserves ultimately providing a mechanism to balance human use with effective protection. The fully protected reserve areas allow fish populations to replenish, while managed access areas provide groups of small-scale fishers exclusive rights to fish in exchange to improved fishing practices.

In Fish Forever's first phase of work(2012—2017), which included 240 communities in Indonesia, the Philippines and Brazil, data showed that 98% of reserves sustained or increased their fish

Youth painting mural with sustainable fishing messages (Ogie Ramos/Photographer)

populations. Results from in-water surveys found that fish biomass had more than tripled inside the reserves and doubled in the surrounding managed access areas where communities continued to fish. Following this mass prototype, the model was codified and replicated. By 2021, the program had multiplied its footprint more than fourfold compared to the first phase, actively working with over 1,000 communities and over 150 local governments reaching nearly 1.7 million community members across 8 countries. These stakeholders are establishing MA+R areas across 5.5×10^6 hm^2 of coastal waters.

(2) Social- economic value

The Fish Forever approach is anchored in establishing clear rights, strong governance, local leadership, and participatory management, cooperation instead of competition. Rare aligns a social movement for ecosystem protection, demonstrating the benefits of collective actions.

① By increasing financial access to fishers with the formalization of small-scale fisher microenterprises.

② By working with communities in conditions of vulnerability and by improving their management of natural resources, increase their livelihood resilience and thus reduce exposure to

economic, social, and environmental threats.

③By ensuring fishers' access to sustainable sources of subsistence harvest and fish for food, advancing more sustainable management of fisheries contributing directly to decoupling this sector from environmental degradation.

④By delivering vocational and technical training and capacity building that increase the net incomes, livelihood security, and decision-making power of some of the poorest populations, enable coastal communities to make a decent living from fisheries.

(3) Innovation

①Fish Forever uses behavioral science to motivate and inspire communities to change, combined with technical assistance, training, and tools.

②Fish Forever uses behavioral insights to ensure easier and more sustainable adoption. This proven approach guides implementation at all levels and aspects of the program, including the establishment of systems related to policy, governance, financial inclusion, and data-for- decision making. Fish Forever's Global Hub for Learning and Collaboration ensures that core principles are contextualized and applied consistently by facilitating an iterative, user-centered design process that generates simplified guidance, tools, and resources to build the capacity of local partners and communities worldwide to drive the work themselves.

③Fish Forever builds the enabling conditions necessary to support the prioritization of coastal fisheries while strengthening legal and functional community rights-based management. Fish Forever's policy team works to secure policy wins across all government levels, increasing political and financial commitments towards coastal communities.

About the applicant: Rare was established in the United States and has been the leading behavior change organization in conservation with a mission to "inspire change so people and nature thrive". Rare partners with communities to identify and adopt new behaviors and practices that balance sustainable use with long term protection of natural resources, and with governments to enable policies and regulations to remove barriers and empower these community-led solutions. Rare strives to scale these solutions, which integrate social, economic, and political interventions, to increase resilience, alleviate poverty, protect ecosystems, and support sustainable development.

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Breathable Urban Community Ecosystem — Leyi Habitat Garden

The Eighth Residents Committee of Lyuyuan New Village, Xinjing Town, Changning District, Shanghai

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Sustainable use of biodiversity

Targets: Ecosystem diversity; Urban; Freshwater & wetland

Location: Luyuan New Village, Xinjing Town, Changning District, Shanghai, China

Year of Implementation: 2020

Background

Featuring a riverside landscape corridor and a land area of 732 m^2,Leyi Habitat Garden, located within the Lyuba Community in the west of Changning District and adjacent to the city's best governed river Nanyupu, is the largest community habitat garden in Shanghai. Upholding the ecological thought that "landscape, forest, field, lake and grass shall be a community of shared life", the garden is divided into six major areas: Four Seasons Garden, Habitat Rest Station, Butterfly Stream, Healing Garden, Science Corridor, and Nature Conservation Area. The "Eighteen Interesting Sites of the Habitat" can be seen around the garden, not only beautifying the shabby forgotten corners in the community, but also creating a model for innovative restoration of the urban community ecosystem.

Iris pond in Leyi Habitat Garden

Main activities

Following the three brainstorming sessions engaging community residents and more than ten regular meetings attended by volunteers and residents with expertise in construction, biology and gardening, Leyi Habitat Garden, with 180 days, created a model for building urban communities with the participation of all their residents, turning a "weedy and humble corner" into a " vibrant and stress-free spot".

Opinions of environmental experts and the public were fully respected in the construction of the community. The garden not only preserves the original metasequoia forest, but also extracts river water from Nanyupu and collects rainwater via the roof and sponge ground to feed the Iris pond via Jiuquhanxi Stream. creating a symbiotic environment that there are hydrilla (*Hydrilla verticillate*), waterlilies, sharpbelly(*Hemiculter Leucisculus*) and decoratve frogs(*Microhyla ornata*) etc., and pure the water and attracts native animals such as Siberian weasels(*Mustela sibirica*), hedgehogs (*Erinaceus amurensis*) and even raccoon dogs(*Nyctereutes procyonoides*) to drink and play by the pond, making it a fabulous habitat rarely seen in urban communities.

In this unique garden, as no pesticides are applied to native flowers and plants, Sichuan peppers, loquats, mandarin oranges, pomegranates, and redleaf cherry plums become the host of insects such as Asian swallowtails(*Papilio xuthus*) and Indian fritillaries(*Argynnis hyperbius*); alongside the stream is the science corridor inlaid with hollow display panels of common local birds; transom window made of bamboo and wood and dimming glass makes the garden house an excellent spot for the residents to observe the birds drinking, bathing, and grooming; the garden house is decorated with Xi Jinping's calligraphy works on his thought of ecological conservation, and leaf-and- petal-collaged characters "Leyi", which is full of sense of wildness; walking through the Mind Cable Bridge, children can observe squirrels, listen to the singing of birds, smell flowers, touch fossils and taste fruits and vegetables in the Healing Garden area, feeling the power and gift from nature in an immersive manner.

While Leyi Habitat Garden was undergoing transformation, a volunteer team named "Leyi's Fifth Space" and made up of building heads, volunteers, and garden and animal experts was set up, and the Residents' Congress passed the Leyi Habitat Garden Residents Convention, in which 16 Articles specified the matters to which visitors need to pay attention, enabling the proper operation and the sustainable maintenance of the precious ecological resources and making it a vivid practice of the thoughts of "the people's city" and ecological conservation.

Main outcomes

(1) Ecological value

One of the most valuable aspects of Leyi Habitat Garden is that, on the edge of the modern city center, it has successfully leveraged the shabby forgotten corners of the community and built a habitat garden that belongs to the native nature of Shanghai. Through scientific design, meeting ecological

requirements , restoring the “iris pond” and “nature conservation area” in the natural habitat, t he garden not only forms two relatively complete micro-ecological circulation systems in the water and on the land, but also attracts various animals to settle in, making that the residents can learn about a wide range of wild the animals via lectures, cloud classrooms, far-infrared videos, and WeChat public account without going out of the community , realizing harmonious coexistence between human and nature , making up for the ecological imbalance caused by rapid economic development, and contributing to the restoration of the urban community ecosystem.

(2) Social--economic value

Situated in the central city residence area, Leyi Habitat Garden integrates functions of habitat, science popularization and recreation, reflecting the social effect of 1+1+1>3. By creating a space where the elderly can relax, white-collar workers can explore nature, teenagers can learn science, and experts can conduct academic research, the garden well satisfied the needs of the community’s differet populations. It is widely reported by media such as *Xinhuanet*, *China Environment News*, *Xuexi.cn*, *Liberation Daily* and *Wenhui Daily* and receives different visiting delegations from Shanghai or elsewhere, becoming a popular destination in the region.

A senior zoo workers living in the community is popularizing ecological science to summer nursery children

Exchange with foreign students of East China Normal University

(3) Innovation

In Shanghai, you can see skyscrapers everywhere. This is what the international metropolis impresses people, and people tend to not believe that this land was also once the home to wildlife, plants, and rivers. Sitting on the edge of the modern city's downtown, Leyi Habitat Garden carefully restores the natural habitats of native animals and plants on the basis of experts'scientific creation, and has become a vivid practice of Xi Jinping's thought of ecological conservation in the new era as well as the important concept that "the people's city shall be built by the people", featuring the characteristics of pioneering, forward-looking and exemplary. Through restoration and construction, nature has returned to the city, and harmonious coexistence between human and nature has been realized in the community.

About the applicant: The Eighth Community of Lyuyuan New Village, Xinjing Town, Changning District, Shanghai adheres to the concept of harmonious coexistence between human and nature, governs by integrating resource innovation, drew the livelihood picture of "Picture of Ten Scenic Spots" in the construction of the ecological community, and buil "Five Famous Gardens", namely Lyuyue Garden, Hanging Garden, Childish Paradise, Love Pet Garden and Habitat Garden, creating a vibrant urban ecosystem.

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A Nature-based Solution Aimed at Restoring Bird Habitat—Ecological Restoration in Yancheng Yellow Sea Wetland Heritage Site

Yancheng Administration Center for Wetland and World Natural Heritage Protection

Approaches: In-situ conservation; Sustainable use of biodiversity

Targets: Ocean and coastal; Freshwater & wetland; Avifauna; Others

Location: Yellow Sea Wetland, Yancheng, Jiangsu Province, China

Year of Implementation: 2020

Background

At the 43rd World Heritage Convention, Yancheng Yellow Sea Wetland, as a habitat for migratory birds in the Yellow Sea(and Bohai Sea) (Phase I), was successfully included in the *World Heritage List*, becoming China's 14th world natural heritage site (hereinafter, "Yellow Sea Wetland Heritage Site"), China's first world coastal wetland heritage site and the world's second world inter-tidal wetland heritage site. Due to the influence and disturbance of human activities, the Yellow Sea wetland ecosystem had been seriously damaged before the world heritage application, which had resulted in the decrease of bird habitats and the loss of biodiversity.

Yancheng Yellow Sea Wetland Heritage Site – Red Carpet

Main activities

In order to restore the ecological function of bird habitats and protect

birds' migration routes, Yancheng has carried out a series of ecological restoration projects in the heritage site by taking measures of ecological reconstruction, assisting regeneration, natural restoration, protection, and conservation based on the technical concept of NbS .

Take Dongtai Tiaozini as an example. Dongtai Tiaozini, which is within the World Heritage site in Yancheng City and an important transfer station of shorebirds on the migration route of the EAAF, saw the habitat loss caused by reclamation, illegal hunting, and human interruptions, leading to the reduction in population and distribution range of shorebirds. In 2020, Dongtai City designated 720 mu of land in the nearby first-line seawall reclamation and aquaculture zones to establish a high tide habitat(known as "720") . Guided by the principle of "mainly adopting the method of ecological and natural restoration, moderately introducing artificial intervention", the first fixed high-tide migratory bird habitat in China was successfully created through habitat construction for small shorebirds such as spoon-billed sandpiper, restoration of bare tidal flat wetland, island construction, and breeding place construction for Saunders' gull on the basis of respecting the law of nature.

Habitat of Yancheng Yellow Sea Wetland Heritage Site after restoration

Yancheng Yellow Sea Wetland — Birds

Soon after its foundation, 1,150 spotted greenshanks(*Tringa guttifer*), an endangered species, were detected by the scientific research and technical team in the "720", breaking the widely accepted belief in the global academic world that there are no more than 1,000 spotted greenshanks left. The number of species of birds living here increased by 22 to 410, and the "720" was praised by the "CCTV News" as the "Chinese sample" of natural heritage ecological restoration.

In addition, the project of "returning fishing pond to wetland" in the endangered birds reserve in the Yellow Sea Wetland Heritage site and the ecological restoration project of No.1 water reservoir of Sheyang Salt Farm have created habitats for birds and other creatures through NbSs, maintaining biodiversity, and achieving remarkable results in ecosystem services.

Main outcomes

(1) Ecological value

Based on the concept of NbS, ecological restoration of Yellow Sea Wetland Heritage Site was carried out to ensure the safety of ecological flyways for migratory birds. This has also contributed to a sound coastal mudflat ecosystem and regional ecology. In this way, regional biodiversity has been effectively restored.

Since being listed in the *World Heritage List* in July 2019, Yancheng Yellow Sea Wetland Heritage Site has made breakthroughs in ecological preservation and environmental conservation. At present, four wetland reserves have been formed, with the protection rate of natural wetlands exceeding 69%. In the Tiaozini area alone, 17,000 mu of aquaculture area has been restored to wetland, and 12,000 mu of smooth cordgrass has been regulated. 2,800 mu of Saunders' gulls breeding place has been set, with full-time staff patrolling and protecting them around the clock to ensure that the breeding of birds in the breeding place is not disturbed by human activities.

(2) Social- economic value

Through the ecological restoration of Yancheng Yellow Sea Wetland World Heritage Site, the living environment have been improved, and the people's growing needs for a better life have been better met. It has greatly improved the urban environment and the image of the city, and created favorable conditions for the medium- and long-term development of the city. Green economy will be the new economic form. Through wetland restoration, ecological advantages will be gained and economic growth will be promoted, so as to lay a solid foundation for the development of ecological tourism.

Yancheng Yellow Sea Wetland World Heritage Site will introduce wetland conservation and public education experience, with a bird habitat and biodiversity research base built to provide teaching practice and promote the enhancement and dissemination of wetland culture. Based on the wetland space, field exploration activities will be carried out to promote the functions and value of the wetland reserve , raise the public's awareness and participation enthusiasm of wetlands and biodiversity and make them more actively participate in wetland and biodiversity conservation activities.

(3) Innovation

The ecological restoration of Yancheng Yellow Sea Wetland World Heritage Site adopted NbSs to restore the wetland ecosystem, which provided technical support for the ecological function of the heritage site, explored a new way to coordinate economic development and ecological conservation, and contributed "Yancheng wisdom" and "Yancheng experience" to the construction of "Beautiful China" and global ecological governance.

About the applicant: Yancheng Administration Center for Wetland and World Natural Heritage Protection, an administration department set up by Yancheng Municipal Government to protect Yancheng Yellow Sea Wetland World Heritage, was officially established on December 16, 2020. Since its establishment, the Center has been committed to strengthening heritage protection and management, conducting scientific research into wetland heritage, promoting sustainable development of heritage and carrying out domestic and international exchanges. It has been practicing Xi Jinping's ecological conservation thought, striving to create an ecological sample of green Yancheng for "Beautiful China", and leaving a beautiful territory of unpolluted sea and beach for the future.

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The Home for Raccoons Dogs: Citizen Science Promotes the Research, Protection and Education of Urban Biodiversity

Conservation Biology Group, Fudan University

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making & implementation; Financial support mechanisms

Targets : Ecosystem biodiversity; Urban ecosystem

Location: Shanghai Municipality, China

Year of Implementation: 2019

Background

The rapid change of the urban environment has added tremendous difficulties to biodiversity conservation. The significant gaps in research, management, and public education have made it more difficult to achieve the goal of biodiversity conservation. The Conservation Biology Research Group of Fudan University closely integrated the three key links of scientific research, conservation management, and public science education. It initiated citizen science projects and successfully filled the gaps in biodiversity research, and promoted the implementation of biodiversity conservation policies in Shanghai, a megacity. At the same time, a large number of public education works have been created, which enhanced the protection effect and created positive social impact.

Main activities

①The project broke the traditional scientific research model and adopted the innovative method to allow “citizen scientists” to carry out research and protection. During the implementation process, the group together with social institutions such as the Shan Shui Conservation Center set up a citizen scientist team of more than 200 citizens, and has promoted the establishment of student associations such as the Natural Science Research Institute of Fudan University. These have planted seeds of citizen

scientists and explored the model for organizing citizen scientist activities.

②Supports policymaking. Taking "human-raccoon dog coexistence" as the starting point, the group assisted Shanghai's forestry departments in formulating an emergency response plan for the human-raccoon dog conflict. It has also resolved citizens' complaints, and has assisted the authorities in handling conflicts between human and wild animals, and promoted the coexistence between urban biodiversity and urban residents. In addition, the group has also provided a lot of policy support. For example, during the COVID-19 pandemic, the group worked together with the Shanghai Forestry Station and formulated a management plan for wild animals such as urban bats to maintain the balance of the urban ecosystem. The group also participated in the formulation of management strategies for stray animals in the urban city. The group, as a member unit of Shanghai Nature Reserve Expert Group and Yangpu Urban Planning and Construction Expert Group, has long been providing suggestions for urban ecological environment development.

③Created a large number of original public education creations, and raised public awareness towards the conservation of urban biodiversity. Original public education materials have been viewed more than 200 million times on Weibo, WeChat, video websites and TV.

Citizen scientists – citizen volunteers are investigating the situation of wild animals

Raccoon dogs are living in residential areas

Main outcomes

(1) Ecological value

Through the participation of the citizen scientist team, a mammal diversity monitoring network covering the whole city of Shanghai was successfully established to fill the data gap. The city-wide distribution and habitat assessment of the raccoon dog, a national class-II protected animal in China, was completed, and the small Indian civet(*Viverricula indica*), a national class-I key protected animal in China, was discovered. This discovery promoted in-situ conservation projects. And projects such as the Binjiang biodiversity restoration were launched.

(2) Social-economic value

In CCTV news channel, *Science Zoo* and other shows, successful cases of urban biodiversity conservation and management were displayed. The group's public welfare public education lessons were played more than 7.7 million times via video platforms online. The video materials have been multiple times forwarded by the Ministry of Ecology and Environment's official Weibo account, displayed on the focus area of the homepage of People's Daily, and reposted by www.xuexi.cn. Shanghai's urban animals such as small Indian civets and raccoon dogs went from obscurity to well-known and even entered the classrooms of elementary and middle schools, generating a positive social impact.

(3) Innovation

The biggest innovation of this project is that it broke the traditional scientific research protection model, and adopted the innovative form of "engaging citizen scientists" and combined scientific research, public participation and public education campaigns. This project splits biodiversity scientific research into modules that are easy-to-operate. The group also recruited citizen volunteers through network platforms to complete the survey, which helped formulate the final policy recommendations.

During the implementation process, a volunteer team composed of more than 300 citizens was organized, to promote the establishment of student associations and use this project as a platform to

connect universities, citizen volunteers, and social institutions. "Guangming Daily" commented that this project "can collect people's valuable opinions on urban ecosystem environment development and community management from the lively discussion of citizens" representatives. *Xinhua Daily Telegraph* commented that this project "helps people to see the changes in wild animal populations and explores the relationship between them and the city. Dozens of media such as *People*'s *Daily* and *China Environment News* all spoke highly of the innovation of the project.

Public education

About the applicant: The core members of the Conservation Biology Research Group of Fudan University are composed of Ph.D. supervisor Wang Fang and more than ten graduate and undergraduate students of Fudan University. In terms of scientific research, from the downtown area of the Yangtze River Delta to the Qinling Mountains of Shaanxi and the wilderness of Liupan Mountain in Ningxia, a large amount of research work has been carried out on giant pandas, North China leopards, raccoon dogs, and small civets; in terms of protection, the research team supported national parks, reserves, and forestry competent authorities to formulate many protection management measures, trained hundreds of reserve workers, and actively served the society; in terms of public education, the group has successfully formed a team of citizen scientists and completed a large amount of science popularization on Weibo, TV and other media.

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Chinese Salmon Land-trust Nature Reserve

The Forever Nature Capital Foundation

Approaches: In-situ conservation; Public participation; Policy-making & implementation; Sustainable use of biodiversity

Targets: Freshwater and wetland; Freshwater creatures; Germplasm resource conservation

Location: Heilongjiang River, Tumen River and Suifen River Basins, China

Year of Implementation: 2019

Background

Chinese Salmon(*Oncorhynchus keta*), Humpback Salmon(*Oncorhynchus gorbuscha*), and masu Salmon(*Oncorhynchus masou*) are anadromous fishes that were once widely distributed in Heilongjiang River, Tumen River and Suifen River Basins, and are the native salmons of China. As a cornerstone species and umbrella species, Chinese salmon, by its migration, has brought abundant marine materials to the inland, playing an irreplaceable conservation role in the river ecosystems. However, the resources and distribution of salmon have declined sharply in recent decades, seriously affecting the ecological security of the basins.

"TAKE ME HOME" public welfare project is a river ecological environmental conservation project initiated by many Chinese entrepreneurs, with the vision of sustainable development of ecological rivers and the mission of restoring the river ecological system. Environmental Education Society of Heilongjiang Province and Fuyuan Salmon Ecological Environmental Protection Association are the executive agencies of the project.

Main activities

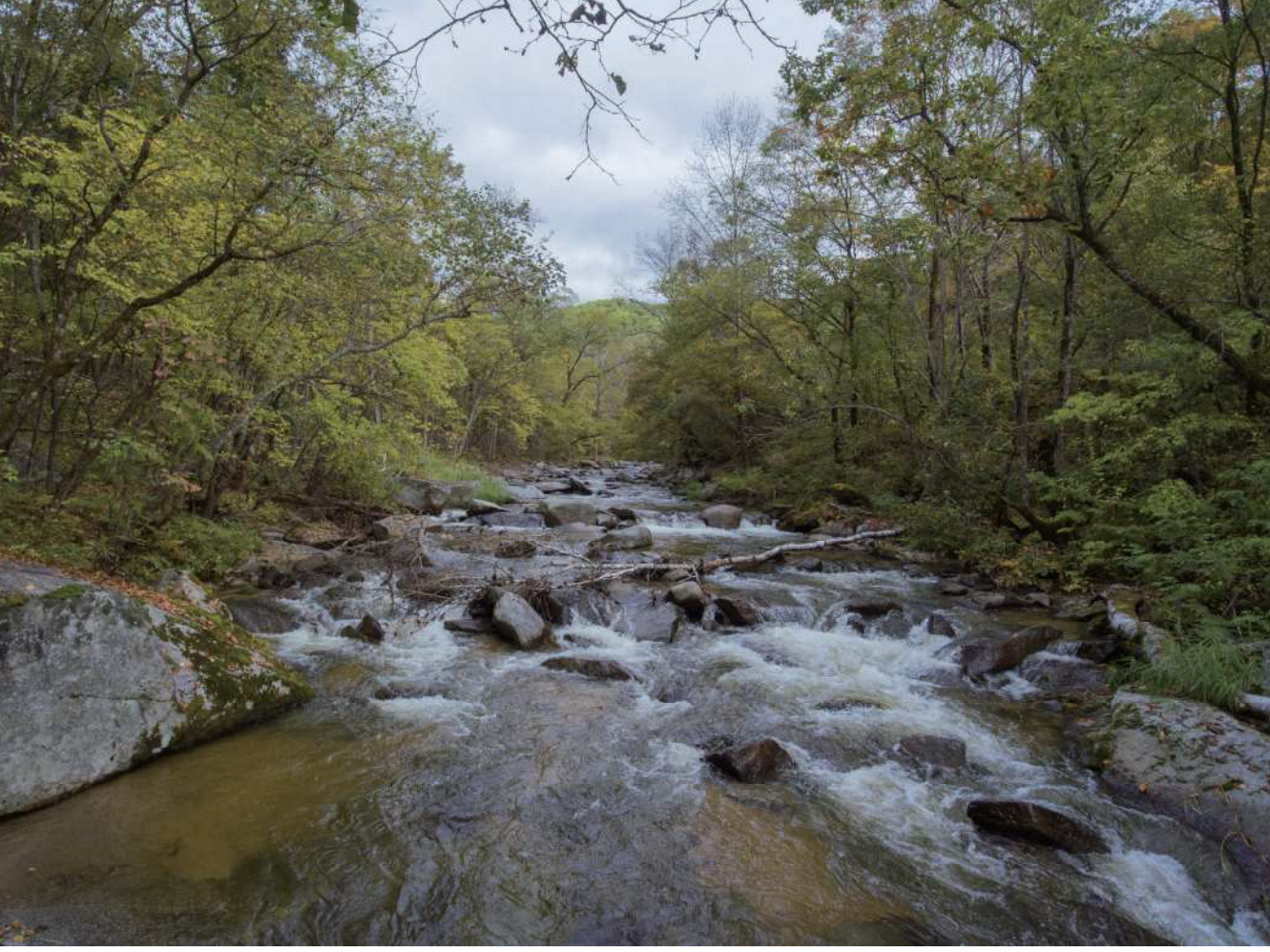
The executive agencies, taking the protection of salmon in the Heilongjiang River, Suifen River and Tumen River Basins as its entry point, carried out the protection of Chinese Salmon in four ways: scientific artificial breeding and release, policy advocacy, land-trust Nature Reserves, and publicity and

education.

The research team, working together with universities and scientific research institutes, provided technical support to three domestic salmon release stations, compiled 6 process documents, and participated in the development of 2 standards. It designed standard release stations to improve breeding skills and management level, through which the survival rate of salmon fry has been substantially improved. It has applied to the North Pacific Anadromous Fish Commission(NPAFC) for a dedicated otoliths number section for the Mijiang Release Station Hunchun, making it the first otoliths marking practice following international standard in China, and giving Chinese Salmon an "international passport".

The executive agencies established the first river-trust Nature Reserve in China along the Suifen River with the support of the Dongning Municipal Government in April 2019, signed the *Cooperation Agreement on the Protection of Wild Fish in the Tumen River Basin* with the Bureau of Agriculture and Rural Affairs of Yanbian Korean Autonomous Prefecture, Jilin Province in December 2019 and the *Cooperation Agreement on Conservation of Endangered and Rare Fish Resources* with the Department of Agriculture and Rural Affairs of Heilongjiang Province and Northeast Agricultural University in August 2020, participated in the construction of characteristic villages with salmon culture in Mijiang Township, Hunchun City and the joint management of the aquatic germplasm resource reserve in 2021, and in the future will drive the local economy with the development of salmon culture and industry.

The fourth generation salmon incubator is in operation. It has improved the survival rate of fish eggs in the release station



Mijiang River Salmon Reserve

Main outcomes

(1) Ecological value

The executive team learned from the advanced experience at home and abroad, explored the best way to protect aquatic wild animals, restored the salmon population resources and other wild fish in China, and finally restored the health of river ecosystem.

(2) Social- economic value

①Utilize masu salmon's characteristic — it can be trained in a land-sealed environment to try seedling and breeding, which will form an industry to drive the economy and finance the public welfare initiative in return.

②Cooperate with the government to create villages with salmon culture, build new salmon industry bases, carry out eco-tourism and research, and integrate fish culture and the culture of the Korean ethnic minority, turning everyone into a fish protector.

③ The project drew on social resources, and cooperated with the government to carry out fishery protection policy advocacy work.

④ Established an exchange platform for the protection of salmon, actively participated in the technical exchanges of the NPAFC, and introduced the otolith marking method into China, consolidating China's status as a source of salmon and facilitating China's efforts in obtaining more maritime rights and interests in the North Pacific.

In December 2019, The Forever Nature Capital Foundation won the "2019 Ford's Conservation and Environmental Grants-Pioneer of the Year Award".

Fish culture homestay in a village around the Salmon Reserve in Mijiang Township, Hunchun City

(3) Innovation

① By drawing lessons from international conservation experience, the Forever Nature Capital Foundation pioneered the domestic river-trust Nature Reserve model, which supplements the efforts by the government.

②Took fish species as the entry point to conducts river background surveys for aquatic life biodiversity and prepare protection plans, filling some of the gaps in fish protection efforts of China.

About the applicant: The Forever Nature Capital Foundation, established in 2016, is the first environmental conservation public welfare foundation in Heilongjiang Province initiated by many Chinese entrepreneurs. The Foundation takes the ecological conservation on rivers and restoration of their sustainable development as its vision and the creation of freshwater river ecological environment system as its mission.

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Conservation and Utilization of Agricultural Biodiversity in Dryland Terraced Field System in Shexian County

Shexian County Dry Terrace Conservation and Use Association

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity; Traditional knowledge

Targets: Farmland; Arid and semi-arid area

Location: Shexian County, Hebei Province, China

Year of Implementation: 2018

Background

Shexian County is located in the middle section of the Taihang Mountains in the southwest of Hebei Province, at the junction of the three provinces of Shanxi, Hebei, and Henan. The core area of the dryland terraced field system in Shexian County is located in a limestone mountainous area lacking soil and rain. The terraced soil is less than 0.5 m thick, with the thinnest part being only 0.2 m. In the process of adapting to nature and transforming the environment, the local people made full use of the unique geographical and climatic conditions and abundant food resources . They created a large-scale stone-based terraced landscape and a unique mountain rain-fed agricultural system that preserves a large number of important agricultural species resources through the farming technique of “preserving grains on the ground”, the storage technique of “storing grains in the granary”, the survival skill of frugality, the custom of reserving seeds passed down from generation to generation, and the agro-ecological wisdom of harmony between human and nature.According to the *Shexian County Chronicles*, in the terraces of Shexian County, there are 176 families, 633 genera, and 1,441 species of plants. Wangjinzhuang Village, as the core area, has 26 families, 57 genera, and 77 species of agricultural species, including 171 traditional farm varieties. It is of great significance for the dryland terraced field system in Shexian County to carry out the conservation and utilization of its agricultural species and heritage diversity.

Group photo of members of Terrace Association who identify farm varieties of bean by field planting (He Xianlin/Photographer)

Main activities

Wangjinzhuang Village, Jingdian Town, located in the core area of dryland terraced field in Shexian County, is selected for the project. Shexian County Dry Terrace Conservation and Use Association(hereinafter , "Terrace Association") established a seed bank through investigation, collection, planting, identification and analysis, thoroughly investigated the background of agricultural species and agricultural genetic resources in the core area, and through field planting identification, distinguished different plants with the same name and plants with different names but belonging to the same species, and verified the character description of the traditional farm varieties obtained through interviews with farmers in the surveys, so as to confirm the name and populations of local traditional crops and traditional farm varieties. On this basis, Terrace Association summarized the characteristics of dryland terraced agricultural biodiversity, conservation and utilization methods, as well as relevant problems, and developed a model of a combination of community seed bank preservation and farmers' own seeds for the in-situ conservation of traditional crops and traditional farm varieties of their live state, providing an experience that can be used for reference for the in-situ conservation of agricultural biodiversity in agricultural cultural heritage sites.

Main outcomes

(1) Ecological value

In the process of adapting to nature and transforming the environment, the locals created a unique mountain rain-fed agricultural system and a large-scale stone-based terraced landscape. A unique vertical mountain microclimate was created with the unique landscape structure, enabling the mountainous areas that are "drought for nine years out of ten" to guarantee the livelihood of local people even in the year with severe natural disasters.

(2) Social-economic value

①Through multi-party participation, the project created especially community participation, a long-term self-sustaining inheritance and conservation mechanism for agricultural biodiversity, which was of great significance for accelerating the development of characteristic industries, revitalizing the rural economy, and focusing on solving the problem of the lack of conservation and utilization subjects.

②This project, relying on the rich agricultural species and genetic diversity resources in the locality, cultivated leading enterprises, developed special agricultural products, taped the economic value and commodity value of traditional farm varieties, improved the economic benefits of terraced farming, and attracted more young farmers to increase their incomes and achieve prosperity through the conservation and utilization of traditional farm varieties of terraced fields.

③The project carried out farmer education to stimulate their endogenous motivation and let them understand the significance of protecting traditional crops and their traditional varieties, thereby causing the younger generation to voluntarily learn to mastering the traditional farming techniques so that such techniques are not lost.

Picture of farm households drying crops harvested in fall
(Wei Herong/Photographer)

(3) Innovation

①Investigation and collection of crop species diversity in the dryland terraced field system of Shexian County is the most comprehensive and systematic survey covering the richest farm varieties resource in dry farming in Northern China. This practice has for the first time innovated the key technologies for the conservation and utilization of crop variety diversity in the dryland terraced farming system of Shexian County, established the first rural community seed bank in Northern China and discovered a

batch of special germplasm resources with important utilization value.

②In this project, the agricultural species and traditional farm varieties were inherited and conserved in their live state through a series of conservation and utilization techniques such as mixed planting, crop rotation, intercropping, and selection of the best. In terms of in-situ conservation of the traditional crops in their live state, a technical system suitable for the local ecological environment has been created, which provides important technical support for the sustainable conservation and utilization of traditional varieties.

Compound agroforestry system of Sichuan pepper tree and grains in terraced fields (He Xianlin/Photographer)

About the applicant: Shexian County Dry Terrace Conservation and Use Association is a NGO aiming at promoting traditional farming culture and the conservation and utilization of dryland terraced fields, enhancing agricultural efficiency, increasing farmers' income and strengthening the sustainable utilization of terraces. Since its establishment, it has carried out a series of actions such as in-situ conservation, planting identification and technique inheritance of traditional crop varieties around the conservation and utilization of biodiversity of Shexian dryland terraced field system, an important agricultural cultural heritage.

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700 mu Farmland in the Taihu Lake Shelters 10% of the Bird Species in China

Suzhou Wetland Protection and Management Station

Approaches: In-situ conservation; Public participation; Policy-making & implementation

Target: Ocean and coastal

Location: Tianfu National Wetland Park in Kunshan, Jiangsu Province, China

Year of Implementation: 2016

Background

Tianfu National Wetland Park, located in the north of Huaqiao Economic Development Zone in Kunshan City, Jiangsu Province, is a rare ecological reserve in the highly modernized urban agglomeration in the Yangtze River Delta region of China. The project site locates within the wetland park, and spans an area of about 700 mu area once was a degraded horse farm. It has become a demonstration area for agricultural wetland conservation and agricultural non-point source pollution control in Taihu Lake after habitat conservation and wetland restoration.

The core challenge for the degradation of the wetland is the contradiction between non-point source pollution caused by agricultural wastewater and grain yield safety. In the rice field system, the agricultural wastewater is rich in various inorganic and organic particulate matters, and also contains a large amount of nutrients such as nitrogen and phosphorus. On the one hand, these nutrient elements can easily cause eutrophication of water bodies after entering lake wetlands, and on the other hand, nutrient elements are valuable fertilizers for agricultural production.

Main activities

①In response to the above problems, the project proposed the land-source particulate matter reduction technology of “ditch-pond-river course” and designed the parallel water particulate matter buffer system to filter and intercept the particulate matter that enters the river during the sowing and

pulping period, which effectively alleviated the adverse effects of agricultural wastewater on surrounding rivers and improved regional water quality.

②The project used farmland ponds to create near-natural habitats, by designing gentle slope ponds of different sizes and depths as well as installing water level adjustment facilities to meet the habitat needs of different birds in different seasons.

③The project improved the ecological monitoring technology, deployed environmental monitoring equipment for water quality, soil, atmosphere, etc., with functions of automatic data collection, recording, and transmission. These equipment can provide timely feedback on restoration results through high-frequency monitoring, hence providing scientific decision-making basis for habitat restoration.

④The project introduced the concept of "paddy fields of four seasons". During the rice harvesting and fallow period, water storage projects were implemented to create shoals, open water, and other suitable habitat conditions for waterbirds to inhabit, providing more habitats for migratory birds, and achieving the sharing of rice fields between human and migratory birds.

The activities provided practical references for effectively solving agricultural non-point source pollution in the Taihu Lake Basin, protected biodiversity of key areas represented by farmland, provided an example for improving the coverage and quality of global terrestrial nature reserves and consolidated the progress of the "United Nations Decade on Ecosystem Restoration" initiative.

Main outcomes

(1) Ecological value

The project preserved the area of basic farmland to the greatest extent, integrated and optimized the original water ecological sensitive areas such as rivers, wetlands and ditches, reduced the entry of agricultural non-point source pollutants into rivers from the source, changed the way of nutrient circulation, effectively improved water quality, increased the biodiversity in the near-natural habitat, especially the farmland, and improved the ecological environment of farming wetland. As of 2019, the ecological technology system developed in the project has reduced 80% of the total particulate matter in the rivers surrounding the farmland, the water quality has been improved from Level V (a poor level) to Level Ⅳ perennially, and the transparency of the water body has increased by 1.5 times. Through the construction of near- natural habitats and paddy

700 mu of farmland in Taihu Lake shelters 10% of the bird species in China

Training Base of Tianfu National Wetland Park

fields of four seasons, biodiversity has been significantly improved, and the number of bird species has increased by 57%. 140 species of birds have been observed on approximately 700 mu of land, accounting for 10% of all bird species in China. At present, the area where the project is located has become the artificially restored habitat with the highest bird diversity per unit area in the Taihu Lake Basin.

(2) Social economic value

①Kunshan Tianfu National Wetland Park innovatively integrated ecological and social resources and, built a wetland nature conservation network to promote the project on a global level. The Park was approved as a pilot of the National Wetland Park in 2013. In 2016, "Tianfu Wetland Nature School" was established and joined the Suzhou Wetland Nature School Network. In 2017, "Suzhou Kunshan Tianfu Training Base" was established to provide professional personnel training services for nearly 400 wetland parks across the country. In 2019, it was approved as a national "Nature Education School(Base)" and was selected as "A member of Wetland Link International-Asia" by the Ramsar Regional Center- East Asia. In 2021, it was selected as "National Forest and Grassland Science Base" by the Chinese Society of Forestry.

②Combining the farming culture in the south of the Yangtze River and targeting different audiences of publicity, the Project developed more than 10 sets of nature education courses with different themes and carried out 319 activities, benefiting the public for 24,718 man-times in a radiative way, making contributions to the sustainable development of wetlands and agriculture in

the Taihu Lake Basin and demonstrating an approach to global farmland biodiversity conservation, restoration, and education.

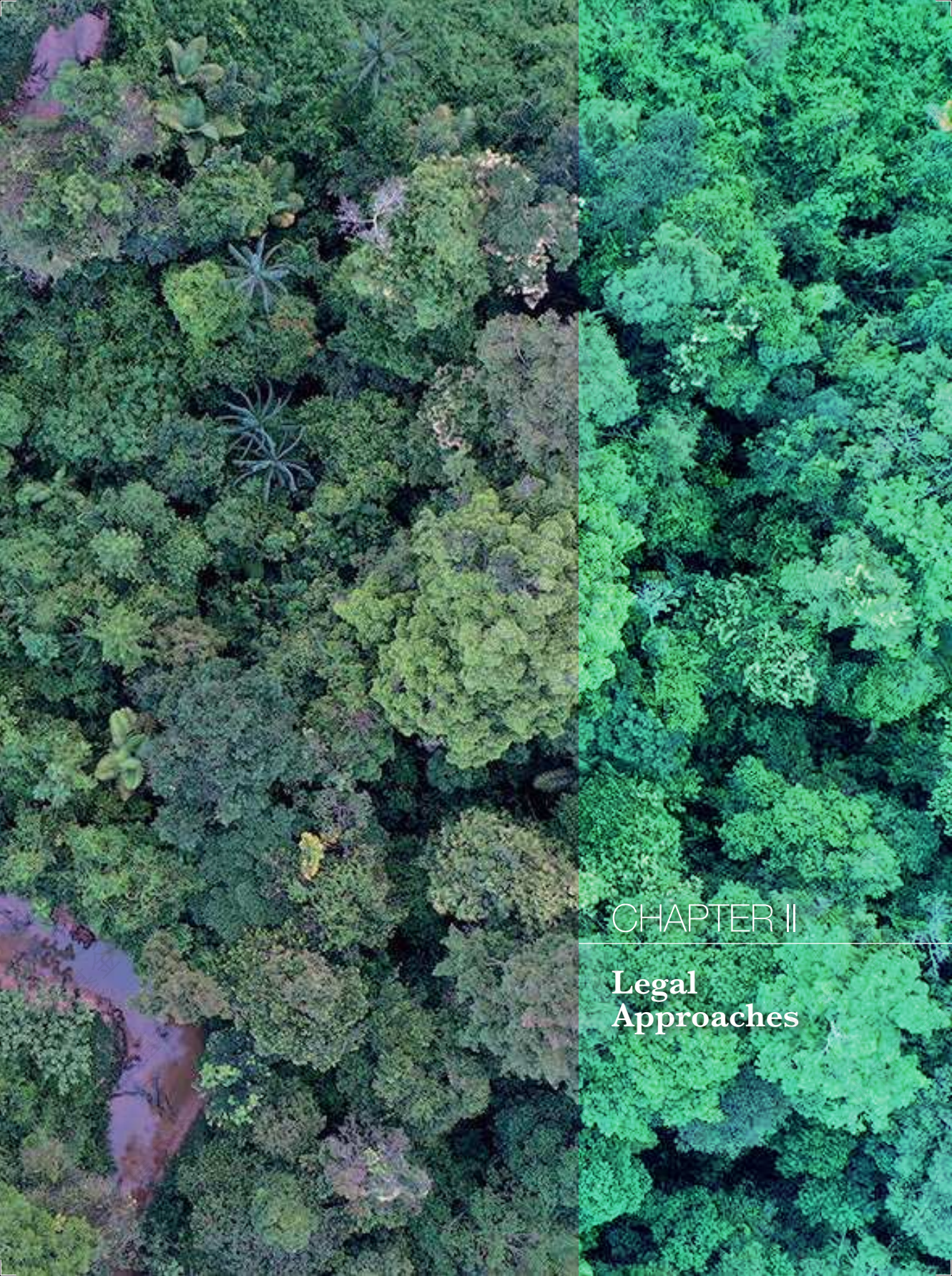
(3) Innovation

①Through the "high-frequency monitoring" technology of farming wetlands, the project verified the regularity and caused theory of periodic emission of pollutants. ②The land-sourced particulate matter reduction technology of "ditch-pond- river course" solved the problem of effective separation of non-point source pollutants from the source, and the operation cost was reduced, providing a new solution to the non-point source pollution that has long troubled agriculture in the Taihu Lake Basin. ③Through the "paddy fields of four seasons", the project provided birds with compensatory habitats. ④The project incorporated biodiversity values into the policy formulation and wetland restoration evaluation system. ⑤High-frequency monitoring technology provided full-cycle data for interception of agricultural non-point source pollution, as a result, quick collection of data and prediction of the trend, and scientific evaluation of the restoration effect of agricultural wetlands with bird diversity as the main evaluation index are realized.

Enterprises' participation in habitat management

About the applicant: Suzhou Wetland Protection and Management Station, established in April, 2009, is the first wetland protection and management organization with the independent organizational system in Jiangsu Province, which is responsible for the protection and management of wetlands in the entire city and has sound scientific and technological strength. The Station presided over the drafting of *Suzhou Wetland Conservation Regulations*, the first local regulation of wetland conservation in Jiangsu Province, undertook more than 10 national-, provincial- and municipal-level scientific research projects, obtained 3 national patents and 4 provincial and ministerial-level scientific and technological progress awards. In 2020, it won the Ecological China - Wetland Conservation Demonstration Award.


GABAY



CHAPTER II

Legal Approaches

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China Green Peafowl Habitat Conservation Actions

Friends of Nature

Approaches: Legal approach; Public participation; Publicity & advocacy; Policy-making & implementation

Targets: Forest; Flora; Avifauna; Germplasm resource conservation

Location: Upper mainstream of the Yuanjiang River Basin, China

Year of Implementation: 2017

Background

Green peafowls (*Pavo muticus*) are national class I key protected wild animals, and survey results released by the Kunming Institute of Zoology and Chinese Academy of Science in 2018 showed that the habitats of green peafowls have lost by nearly 60% in the past 30 years, and the Shiyang River and its tributaries, located in the upper mainstream of the Yuanjiang River Basin in Shuangbai County and Xinping County, are the last large and relatively intact habitats for green peafowls in China.

A green peafowl in the monsoon forest (Xi Zhinong/Photographer)

In March 2017, the Chinese environmental conservation organization "Wild China" found that part of the submerged area of Hydropower Station (Level I) under construction on the mainstream of the Red River (Yuanjiang River) was just located in this area. A large area of suitable habitat for green peafowls is also preserved here. Once construction of the hydropower station commences, the green peafowl habitat in

this area will no longer exist, posing a major risk to the survival and reproduction of the endangered green peafowls.

Group photo of the Green Peafowl Action Team before drifting

Main activities

① Three social organizations, Wild China, Friends of Nature, and Shan Shui Conservation Center, urgently sent letters of advice to relevant administrative authorities, calling for a halt to the construction of the hydropower station and a reassessment of its impact on important protected species such as green peafowls and their habitats. In July 2017, Friends of Nature filed China's first preventive environmental public interest lawsuit for wildlife protection in the people's court, and organized several drifting trips for experts in flora and fauna to carry out biodiversity baseline survey in the submerged areas of the hydropower station. In March 2020, the court ruled that: the developer shall immediately stop the construction project of Jiasa River Hydropower Station (Level I) based on the existing environmental impact assessment, and shall not intercept river for water storage or cut down vegetation in the submerged area of the hydropower station.

② After the lawsuit, the three environmental conservation organizations began policy advocacy, and formally sent over 10 decision-making proposal letters and policy suggestions to the decision-making organs, finally pushing the green peafowl habitats in the submerged area of Jiasa River Hydropower Station (Level I) being included in the Ecological Conservation Redline of Yunnan Province. Moreover, conservation institutions carried out a series of media communication, public engagement and cross-border cooperation to attract and support public participation in the conservation of endangered species, by doing this, public awareness and participation in the protection of endangered animals are enhanced.

Main outcomes

(1) Ecological value

Part of the submerged area of Jiasa River Hydropower Station (Level I) on the mainstream of the Red River (Yuanjiang River) happens to be a suitable habitat for green peafowls, and it is also the habitat for many rare species, such as *Cycas chenii* and Mrs. Hume's pheasant (*syrmaticus humiae*) , forming an intact ecosystem with a large area of primitive tropical monsoon forest and tropical rain forest fragments. Finally, the green peafowl conservation action stopped the construction of the Jiasa River Hydropower Station (Level I), allowing an intact ecosystem of great ecological value being preserved.

Foraging green peafowls (Xi Zhinong/Photographer)

(2) Innovation

The green peafowl action lawsuit is the first preventive public interest lawsuit for wild animal protection in China. The verdict was made based on comprehensive consideration of socio-economic impact and the reasonableness and timeliness, and has effectively prevented the major risk of extinction of endangered species, and the major risk to the ecological habitat of green peafowls has been effectively controlled. This case practiced the most important principle —"risk prevention" in biodiversity conservation. It has realized "in-situ conservation" for rare and endangered species, effectively avoided the irreversible ecological risk of extinction of rare and endangered species. In this practice, China's judicial system exerted its important role in biodiversity conservation. This practice provides a practical example for China and more countries to protect endangered species and ecosystems through judicial means.

About the applicant: Established in 1993, Friends of Nature is one of the earliest non-profit environmental conservation organizations in China, and it is dedicated to protecting the precious ecological environment and promoting the emergence of more and more eco-friendly citizens and their growth. Taking environmental education, public participation and mobilization, law and advocacy as core working methods, and urban waste reduction, energy-saving and low-carbon living, pollution source investigation and supervision as main working topics, it deeply intervenes in major environmental events that break through ecological bottom line and cultivates and supports green citizenship actions.

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Selection of Typical Judicial Cases of Global Biodiversity Conservation

ClientEarth

A. Tanzania: No Highway Construction in the Serengeti National Park

Approach: Legal approach

Targets: Forest; Mammals; Marine creatures; Species diversity

Location: Serengeti National Park, Tanzania

Year of Implementation: 2010

Background

In 2010, the Government of Tanzanian planned to build a 53-km highway, believing that this highway will serve as a link between the northwest and other parts of the country, and may promote the rapid development of domestic economy. However, the plan has been challenged, with opponents arguing that the highway crosses the Serengeti National Park, which has been listed as a world heritage site by UNESCO (United Nations Educational, Scientific and Cultural Organization), and that engineering construction may lead to environmental damage and seriously affect the migration of the wildebeests(*Connochaetes taurinus*) .

A lion(*Panthera leo*) cub (Omer Salom /Photographer)

Main activities

Africa Network for Animal Welfare(ANAW) , a Kenya-

based social organization, filed a lawsuit in the East African Court of Justice, claiming to stop the highway project permanently. ANAW believes that this highway project violates the provisions of the *East African Community Treaty*. According to the requirements of the *Treaty*, all contracting parties(including Tanzania) are obliged to protect and manage the environment and natural resources. In 2014, the Court ruled in the first instance that the Tanzanian government's decision on this project was unlawful.

The Government of Tanzanian argued that the *Treaty* does not entitle the Court the power to issue injunctions. The Court, however, held that it possessed inherent power to issue injunctions, including permanently prohibiting the governments of contracting parties from carrying out any action that is an infringement of the Treaty. In this particular case, the Court opined that for any contracting state's any primary idea or plan, if any of the following conditions is met, the primary idea or plan is a challengeable act of the state: agreed architectural plans and drawings; lists of work quantity; cabinet approval of the project; appropriate budget, endorsed or approved by parliament; commencement of loan borrowing processes for financing the project where necessary; commencement of procurement processes (whether public or private bidding), as appropriate; practical manifestation of actual commencement of engineering works (such as official field surveys or delivery of construction machinery and materials to the site).

After weighing economic benefits and the need for conservation of biodiversity, the court ordered a permanent halt to all future plans to build a highway in Serengeti.

A large number of wildebeests are crossing the Mara River in Serengeti (Jorge Tung /Photographer)

A hesitating and curious little monkey in the savannah
(Magdalena Kula Manchee/ Photographer)

Main outcomes

(1) Ecological value

The Serengeti National Park in this case is one of the most important biodiversity hotspots in the world. Building a highway in Serengeti will encroach on natural habitats and put tremendous pressure on the survival of migratory animals. As the court ordered a permanent halt to the plan, the natural habitats and migratory animals in Serengeti will be protected.

How to balance economic development and environmental conservation is debate a that will never end. This case highlighted this point once again.

(2) Innovation

This case is an important judicial practice in applying precautionary principle in ecological environmental conservation. It protected the Serengeti National Park's ecosystem and biodiversity from being damaged by highway project from the source, and clarifies the bottom line that no roads can be built in the National Park in the future. The application of precautionary principle and the court's argument for jurisdiction in this case are both highly innovative.

B. Brazil: Case for Protecting the Amazon Rainforest

Approach: Legal approach
Target: Forest
Location: Brazil
Year of Implementation: 2017

Background

The Amazon rainforest is the largest tropical rainforest in the world, and nearly 60% of it lies within Brazil. In large, remote areas of the Amazon rainforest, deforestation often occurs as it is uninhabited. Evidence shows that deforestation is the main reason for the disappearance of Amazon rainforest. Satellite pictures documented logging and wood processing activities, and these photos and transportation documents are evidence of illegal deforestation. Where all trees have been cut down, loans have been taken out to purchase the lands and convert them into pastures, or farm on the lands.

Brazil's Amazon rainforest at the crossroads and its future development (Leo Correa/Photographer)

In response to deforestation, in November 2017, the Federal Attorney's Office(ministério Público Federal) of Brazil launched the "Defend Amazon" campaign to demand compensation for deforestation and to promote reforestation in degraded areas.

Main activities

At the end of 2020, a deforestation case related to the "Defend Amazon" campaign was heard in court. The Federal Attorney's Office and IBAMA filed a civil lawsuit against "an unidentified and unaccounted owner of an embargoed area" on 67 hm^2 of deforested land, requiring him to plant trees in degraded areas, and pay compensation accordingly. In February 2021, the Supreme Court of Brazil ruled in favor of prosecutors in the fight against illegal deforestation, and announced that landowners may also be held liable for deforestation that has occurred on the lands they own in recent years, whether the lands were in their name at the time of deforestation.

Blue poison dart frog(*Dendrobates tinctorius "azureus"*) (Adobe/Photographer)

This case has set a precedent for the "Defend Amazon" campaign. And one of the key points of this case is the argumentation for obligation in rem. In some areas of the Amazon rainforest, there is a way to legalize illegal invasion. For example, loggers may apply for loans to buy lands cleared of trees through notarization or registration, and then convert them into pastures, or develop agriculture on these lands through private or public bank loans. However, establishment of the obligation in rem means that the obligation to restore the forest and make compensation falls on the current owner of the land. This cleared the way for prosecutors to continue handling 3,500 outstanding cases. For illegal intruders, deforesters and those who acquired land rights by sub-purchasing from intruders, the illegal behavior chain in the guise of legality is broken, and the chain of illegal interests in deforestation is severed.

A Scarlet macaw((*Ara macao*) photographed in Nueva Pacaías National Park, Brazil
(Diogo Hungria/Photographer)

In addition, prosecutors also use satellite images to identify the extent of past rainforest deforestation and prevent further deforestation.

Main outcomes

(1) Ecological value

At an online Leaders Summit on Climate held by the United States in 2021, Bolsonaro, the President of Brazil at the time, stated that he would eliminate illegal deforestation by 2030 and reduce carbon dioxide emissions by 43% by 2030 to achieve climate neutrality. This aggressive public interest litigation campaign initiated by federal prosecutors has made great contributions to the conservation of the Amazon rainforest, the world's largest terrestrial biodiversity hotspot.

(2) Innovation

The case is innovative in that as a precedent for the "Defend Amazon" campaign and closes a legal loophole. It expanded the scope of the subject responsible for deforestation in law to include the current owner or holder of the land, that is, even if the current owner or holder of the land is not directly engaged in illegal logging, the law still holds them responsible.

C. Australia: Bulga Coal Mine Case

Approach: Legal approach

Targets: Ecosystem diversity; Species diversity

Location: Australia

Year of Implementation: 2010

Background

In 2010, the Minister of Planning and Infrastructure of Australia approved Warkworth Mining Linnited's open-pit mine expansion project. This administrative decision aroused dissatisfaction among Bulga villagers. The latter filed an application in the Land and Environment Court of New South Wales Land and Environment Tribunal, requesting the Court to conduct an external merits review on this decision. Villagers argued that the decision on approving the project should be rejected because the project will have an impact on biodiversity, and bring noise, dust, and other unacceptable social impacts.

Main activities

The court rejected the project application to expand the coal mine project based on the following considerations: impact on biodiversity; noise and dust impact; social impact; economic factors.

In reviewing the administrative decision on approving the application for project extension, the court first interpreted the relevant laws and regulations. According to the law, the decision maker has the power to approve or reject the project, but the court has the power to review the merits of the administrative decision. The court also considered the nature, scope and conditions of the discretionary powers that exercised by the Minister of Planning and Infrastructure. Based on the evidence submitted, the court determined the possible impacts of the project on the environment, the nature and type of each impact, and the effectiveness of the measures submitted together with the application for project commencement. When examining the various impacts of the project, the court followed the principle of "considering all matters in a balanced way and weighing the

Mount Thorley-Warkworth mine (Zetter/Photographer)

Transportation of coal in New South Wales
(Jessica Hromas/Photographer)

Speckled warbler(*Pyrrholaemus sagittatus*)
(Duncan McCaskill/Photographer)

impacts one by one".

Finally, the court concluded that the project extension may have a significant impact on endangered ecological communities and key habitats of the species of the local fauna. And Warkworth's compensation scheme and direct compensation measures and other compensatory measures are not sufficient to compensate for the significant impacts to be suffered by the endangered ecological communities. The court weighed the negative and positive impacts of the project, particularly the economic benefits, and ultimately rejected the application for coal mine project extension and expansion.

Main outcomes

(1) Ecological value

In this case, the plaintiffs opposed the expansion of the coal mine and requested the court to reject the application for extending the validity period of the coal mine project license. The court finally ruled on the case and rejected the application for expansion, which prevented the direct damage to biodiversity from the source. At the same time, this case also represents a major victory of environmental justice.

(2) Innovation

In this case, for the approval of projects that may have potential impacts on the environment, the court established review standards for relevant administrative decisions and elaborated the process of reviewing the environmental impacts of projects. In the verdict of this case, the court listed the standards and steps for such review, which further consolidated the legal guarantee for biodiversity conservation.

D. Costa Rica: Ban on Bee-harming pesticides

Approach: Legal approach
Target: Insects
Location: Costa Rica
Year of Implementation: 2018

Background

Neonicotinoid insecticides account for more than 25 % of the global market share of insecticides and are applied to almost all major crops. This kind of insecticides are so potent that they can not only destroy insects through direct contact, but also infiltrate into plant tissues and cause insects to die after eating the plant. As a result, un-targeted insects can also be affected—bees, for example, can be damaged by neonicotinoid insecticides through nectar and pollen.

Bees at the entrance of a hive

Scientists have long believed that the decline in bee populations is linked to the use of neonicotinoid insecticides. Such chemicals can damage bees' nervous systems and affect their ability to learn and remember—an ability that is crucial for social insects such as bees, as they rely heavily on their learning and memory abilities to communicate with their peers about where the food is located.

Main activities

In keeping with its tradition of prioritizing the environment, Supreme Court of Justice of Costa Rica ordered the country's Ministry of Agriculture and Livestock to organize scientific studies, analyze neonicotinoid insecticides, and study their impact on bees, the environment and public health as one of the world's most widely used pesticides. The findings may prompt Costa Rica to introduce a ban on the use of insecticidal agents that damage pollinators.

Beekeeping in Costa Rica

A male orchid bee (Euglossa sp.) collecting mycelium from tree bark(Costa Rica) (Gil Wizen/Photographer)

The main legal issue in this case is whether the precautionary principle can be applied and when to apply the precautionary principle and take the preventive measures. The court affirmed that the state must act to prevent risks to biodiversity and the environment. For example, if an activity may have a negative impact on the environment, and the risk of causing environmental damage is certain to some extent, the preventive principle should be adopted, which means that the potential environmental damage must be fully assessed and checked before any activity is carried out. On the other hand, if the impact of an activity on environmental sustainability can't be fully confirmed scientifically, the precautionary principle should be applied, requiring the state not to delay effective measures to prevent environmental degradation or damage to biodiversity on the grounds of lack of scientific certainty.

Main outcomes

(1) Ecological value

The court ruled that the Ministry of Agriculture and Livestock should conduct a scientific study to analyze the impact of agrochemicals containing neonicotinoids on the environment, biodiversity and public health in Costa Rica, and that measures should be taken to protect those constitutional rights which may be harmed or seriously threatened. By this decision, the court has safeguarded the public's right to health and life, as well as the citizens' right to enjoy a sound environment. It also ensured the country's grain safety and biodiversity.

(2) Social-economic value

This case embodies the significance of public participation in justice. The public may, through judicial means, demand that the state undertake useful activities to fulfill its responsibility to protect the life, health and environmental rights of the people, including explicit recognition of the imminent threat(risk) of environmental damage to biodiversity and personal rights.

(3) Innovation

This case sets a typical precedent for fully interpreting the precautionary principle. Environmental conservation is the responsibility of the state. When it comes to protecting the public's right to health and environment, the governments shall follow the two most important principles of preventive principle and precautionary principle in fulfilling their obligations to minimize the impact of human activities on environmental degradation and destruction.

E. India: The Asiatic Lion Case

Approach: Legal approach
Target: Mammals
Location: India
Year of Implementation: 2004

Background

Asiatic lions (*Panthera leo* ssp. *persica*) are endangered species. According to historical records, Asiatic lions once widely live in most parts of West Asia, the Middle East, and northern India. In the early 20th century, this species was nearly extinct. Since protection and conservation were strengthened, its population has recovered to some extent. At present, the range of Asiatic lion moving around is limited to India's Gir National Park and the Park's surrounding areas, with the existing wild population being only about 500.

In 1990, a subordinate unit of the Indian government proposed to establish a second wild Asiatic lion habitat to protect the population of Asiatic lions in Gir National Park from disasters. After in-depth investigation and research, experts found that Kuno Wildlife Sanctuary was the best place to reintroduce Asiatic lions. The local government immediately carried out a series of preparatory work, including the relocation of villages. However, in 2004, the Gujarat Government refused to relocate some Asiatic lion populations to the new habitat.

Main activities

Two environmental organizations—the Centre for Environment Law and WWF India—filed a case in the court against the Gujarat Government, seeking to force it to reintroduce Asiatic lions.

The question for determination in this case before the Supreme Court of India was whether or not there was a necessity for the introduction of Asiatic lion to Kuno Wildlife Sanctuary. While examining the necessity of creating a second habitat for Asiatic lions, the Supreme Court relied on the following relevant

An Asiatic lion in Gir Forest (Adobe/Photographer)

matters: the anthropocentric v. eco-centric approaches; importance of introducing species into historical habitats; prey density at Kuno.

When hearing this case, the supreme court put the need to protect the ecological environment in the first place, and adopted the most beneficial practices for species protection. The court disregarded the anthropocentric approach which postulates that "humans take precedence and that humans' responsibilities to non-humans are based on the satisfaction of humans' benefits" in favor of the eco-centric (nature-center) approach which propounds that "humans are part of nature and not only human species have their intrinsic value". The Supreme Court opined that Article 21 of the Constitution of India(this Article is about "Right to Life") not only protects humans' rights, "but also casts an obligation on human beings to protect and preserve endangered species, protection of environment is an inseparable part of safeguarding right to life". The court relied on the doctrine of public trust as enunciated in its earlier decision in M. C. Mehta v. Kamal Nath et al.(1997) 1SCC388. The doctrine suggests that certain common properties such as rivers, seashores, waters, forests and air "are held by the government in trusteeship for free and unimpeded use of the general public" and that "the state, as a custodian of the natural resources, has a duty to maintain them not merely for the benefit of the public, but also for the best of flora and fauna, wildlife and so on. " In accordance with the doctrine, the supreme court opined that "human beings have a duty to prevent the species from going extinct and have to advocate for an effective species protection system".

Entrance of Palpur-Kuno Wildlife Sanctuary (Sameer Garg/Photographer)

After a detailed study, the experts unanimously believe that to have a second home for an endangered species like the Asiatic lion is of vital importance, and that the Kuno Wildlife Sanctuary is the best habitat for the reintroduction of Asiatic lions. Considering the fact that the Asiatic lion had historically lived in the wild in Kuno and prey density now existed in Kuno, the supreme court ordered the Ministry of Environment and Forest to issue a directive to reintroduce Asiatic lions to Kuno within six months.

In 2013, the Supreme Court of India ruled in favor of the plaintiffs, and the Gujarat Government was dissatisfied and filed an appeal, which was then rejected. But up to now, the reintroduction work has not yet been carried out.

Main outcomes

The Asiatic lion case is instructive on a global scale, and demonstrates the importance of government intervention in increasing the population of endangered species. In addition, the method of protecting endangered species through rewilding involved in this case is also instructive to prevent the loss of biodiversity. The rewilding has its complexity, but as a new method, rewilding does bring hope for the restoration of regional biodiversity.

Asiatic lion cubs are frolicking (Scooperdigital/Photographer)

F. Belgium: Traders in Protected Bird Species Sentenced

Approach: Legal approach

Targets: Avifauna

Location: Belgium

Year of Implementation: 2008

Background

The four suspects in the case belonged to the same criminal organization, which specializes in poaching activities in Spain and southern France. Most of their poaching targets are eggs and chicks of rare birds of prey. The suspects handed over the prey they caught to farms for incubation and breeding, and forged CITES export licenses for commercial transactions. By virtue of the above illegal methods, the organization has made huge profits. The illegal bird trade is lucrative. For example, Bonelli's eagles(*Aquila fasciata*) sell for EUR 10,000 each, bald eagles *(Haliaeetus leucocephalus)* sell for EUR 5,000 each, African fish eagles *(Haliaeetus vocifer)* sell for EUR 6,000 each, and beeted eagles (*Hieraaetus pennatus)* sell for EUR 5,000 each.

After a long and large-scale joint investigation by prosecutors from Belgium, Britain, Spain, France, Germany, Austria and the Netherlands, a Belgian court finally convicted the four people for smuggling protected endangered birds.

Main activities

The prosecutors sued the four suspects for participating in organized criminal activities, forging CITES export licenses, failing to keep CITES records, and illegally using traps and fishing nets to catch birds. After investigation, the court found the above charges are true and imposed a fine and short-term imprisonment on the suspect. In the judgment, the court emphasized that the defendant made a direct and irreversible impact on biodiversity, and severely undermined the efforts made at the national and international levels to protect these fragile and rare bird species. Bird Protection Organization, a Belgian social organization, participated in the lawsuit as a civil party and received EUR 15,250 in spiritual compensation.

Egyptian vulture(*Neophron percnopterus*)
(Tomáš Adamec/Photographer)

Main outcomes

(1) Ecological value

This case contained the further loss of biodiversity and contributed to the maintenance of global biodiversity and ecological security through regional and global cooperation and the use of judicial means.

(2) Innovation

This case is a typical case of multi-country successfully combating organized international crime through cooperation. Organized international crime is one of the main reasons leading to the loss of biodiversity, which is difficult to crack down on as multiple links are involved such as poaching, smuggling, distribution and sale of illegal wild animals. In this case, multiple countries cooperated in cracking down on illegal trade in wildlife, protected the livelihoods of local communities, maintained social and economic development, and strengthened national ecological security, highlighting the importance of international legal cooperation in collecting conviction evidence. Transnational illegal smuggling of endangered species is also an important factor leading to the loss of biodiversity.

The special significance of this case is also reflected in the court's recognition of the social organization's qualified plaintiff status and support for its claim of compensation for mental damage.

An African fish eagle (Wayne Davies/Photographer)

Red-footed falcons(*Falco vespertinus*)
(Carolien Hoek/Photographer)

G. Colombia: Deforestation in the Amazon Rainforest

Approach: Legal approach

Target: Forest

Location: Colombia

Year of Implementation: 2018

Background

In 2018, 25 young plaintiffs ranging from 7 to 26 years old filed a special constitutional lawsuit against the Colombian Central Government, several local governments, and companies. The plaintiffs claimed that climate change caused by the government's ineffective response to deforestation had violated their individual and collective rights, including the right to a healthy environment, the right to life, the right to health, the right to food and the right to water.

The plaintiffs believed that, in accordance with relevant international treaties and national laws, the Colombian Government has a statutory obligation to reduce the rate of deforestation year by year, but the fact was that the rate of deforestation was accelerating rather than slowing.

Colombian youth fight for the Amazon (Dejusticia/Photographer)

Main activities

The forest damaged in the south of Colombia (Andrés Cardona/Photographer)

The district court initially rejected the plaintiffs' request. The plaintiffs appealed to the Colombian Supreme Court and got its support ultimately. In its judgment, the supreme court emphasized the threat of deforestation to biodiversity—an imminent crisis caused by the deforestation of the Amazon rainforest is the mass extinction of animals and plants. The supreme court held in its judgement that the basic rights of life, health, minimum living security, freedom and human dignity are all closely related to and determined by the environment and ecosystem. Following the precautionary principle, intergenerational fairness and solidarity principle, the court believed that deforestation has posed a threat to the basic rights of future generations.

The court issued a mandatory order requiring the government to formulate an action plan to deal with deforestation and climate change; to reduce deforestation and greenhouse gas emissions through creating the "Intergenerational Pact for Life of the Colombian Amazon (PIVAC)" by attracting the public's extensive participation; and to take practical actions within 48 h after the judgment takes effect, so as to alleviate the deforestation issues.

Main outcomes

(1) Ecological value

The supreme court held in this case that Colombia's Amazon forest, "the lung of the earth", belongs to the "subject of rights", and the country and the international community are obliged to protect it. The judgment highlighted the threats to biodiversity in the reasoning part. According to reports, about 57% of tree species are at risk. In addition, the court regarded the ecology as a whole, and emphasized that large-scale deforestation of the Amazon forest would destroy the ecological connection between Amazon forest and the Andes, causing the extinction of or bringing threats to the species inhabiting the ecological corridor, thus "damaging the ecological integrity".

(2) Social-economic value

The social impact of this case lies in that criticizing the anthropocentrism and the selfish

paradigm of human hegemony, and adopting the "ecological-centered — human-centered" standard which places humans and the ecosystem on an equal footing, thereby avoiding arrogant attitudes toward environmental resources.

Importance is attached in this case to the active participation of the public, including affected communities, scientific institutions or environmental research organizations, and the general public with relevant interests. Judging from the execution of this case, the court's judgment promoted bottom-up actions to protect nature.

(3) Innovation

The court adopted an "ecological-centered" approach, recognized Colombian Amazon forest's legal status as a "subject of rights" the for the first time, and determined that it is entitled to be protected, preserved, maintained and restored by the state and local agencies. In the case of the government's ineffective response to deforestation, the court has paved the way for the people to protect the forest through litigation.

A stream in the Colombian Amazon rainforest (Rhett A. Butler/Photographer)

H. Philippine: Marine Mammal Protection Case

Approach: Legal approach
Target: Marine creatures
Location: Philippines
Year of Implementation: 2007

Background

Tañon Strait is an important habitat for marine mammals such as dolphins and whales and is located on their migration route.The number of marine mammals in this area however is decreasing year by year.

In November 2007, the oil exploration company Japan Petroleum Exploration Company Limited (JAPEX) started drilling wells for exploring oil and gas in the Tañon Strait in the Philippines. In response to this behavior, local lawyers and an social organization sued JAPEX in the name of protecting marine mammals such as dolphins, and the case went to the Supreme Court of the Philippines.

Main activities

JAPEX stated that its exploration activities were supported by a presidential decree. However, the Tañon Strait is an environmentally fragile area and had been designated as a protected area. Local residents claimed that oil exploration activities have adversely damaged the environment, and also caused a decrease in the number of fish that can be caught in the strait. JAPEX hadn't consult or discuss with local stakeholders before starting oil and gas exploration activities.

Two major questions need to be considered by the supreme court in this case for making the judgment: Who has the legal standing to sue as a plaintiff? Is the presidential decree valid?

The consolidated petition involved three different kinds of plaintiffs: the resident marine mammals(including toothed whales, dolphins, Phocoenidaes and other cetacean species that inhabit the waters in and around the Tañon Strait); the stewards of nature; and environmental

Yanchuanchong oil and gas field of JAPEX (JAPEX /Phtogorapher)

Spinner dolphins(*Stenella longirostris*) in Tañon Strait (Danny Ocampo &Oceana Philippines/Photographer)

Fish guardians (Gregg Yan/Photographer)

organizations.

When deciding the eligibility of the plaintiffs, the supreme court adopted the *Rules of Procedure for Environmental Cases*, which stipulate that "any Filipino citizen in representation of others, including minors or generations yet unborn, may file an action to enforce rights or obligations under environmental laws".

The supreme court ruled that the standing for animals was not longer necessary in this case, and that humans, as stewards of nature, can bring actions on nature's behalf to urge relevant parties to fulfil their mandatory environmental protection obligations.

According to the court, the Tañon Strait was designated as a protected area in 1998. No activity outside the scope of its management plan could take place without the delivery of an environmental compliance certificate. The court ruled that the defendant violated the *National Integrated Protected Areas System Act* promulgated in 1992.

Furthermore, the court held that the presidential decree was ultra vires as the Tañon Strait is a protected area, the contract required a law passed by the Congress. Therefore, the constitutional court announced that the contract and all the permits related to oil exploration in the Tañon Strait were invalid.

Main outcomes

(1) Ecological value

Marine biodiversity also plays a vital role in mitigating climate change. Therefore, the conservation of marine biodiversity can't be delayed. This case effectively prevented further damage to the marine ecosystem caused by offshore drilling and other destructive projects(such as reclamation) and protected the precarious marine environment.

(2) Innovation

The judicial organ in this case through the judgment, emphasized the important rights of animals, and reiterated that environmental conservation is the country's uncompromisable responsibility. At the same time, this is a typical case of using legal means to protect marine biodiversity, which is also instructive for the global marine biodiversity conservation.

I. Finland: Wolf Hunting Declared Illegal

Approach: Legal approach
Target: Mammals
Location: Finland
Year of Implementation: 1997

Background

Wolves are listed in Annex Ⅳ of the European Union (EU) Habitats Directive(Council Directive 92/42/EEC 1992) as strictly protected species, which means that except for a very limited number of reasons, killing such animals is strictly prohibited. However, Finland obtained an exemption through negotiation and listed wolves in certain parts of the country in Annex V which imposes fewer restrictions on hunting wolves, so that hunting permits could be granted justly by the local Finnish authorities. According to the government, these permits are actually a safety valve to prevent humans from hunting wolves for revenge. Although wolves are protected by EU law, and Finland, as a member of EU, shall abide by the law, Finland can continue to hunt wolves because of the existence of this loophole.

A social organization in Finland has filed a series of lawsuits regarding this case.

Main activities

A large environmental social organization in Finland filed a complaint with the European Commission against the local government's issuance of wolf hunting permits in 1997. The commission initiated formal infringement proceedings against the Finnish government, and the case was accepted by the European Court of Justice, which promoted the country to introduce a stricter *Hunting Law*. However, according to Article 16(1)(2) of the *Law*, under strictly supervised conditions, on a selective basis and to a limited extent, issuance of wolf hunting licenses was still allowed , which leaves room for the government to use its discretion. Worse still, a management plan was issued by the

Hunter Ari Turunen and his dog (Davide Monteleone/Photographer)

government in 2014 to reintroduce managed wolf hunting despite the public's objection.

Although environmental organizations are generally allowed to bring public interest litigation as a contracting party of the *Aarhus Convention* signed by Finland, bringing a litigation regarding hunting permits in the country are regulated by the *Hunting Law*, which stipulates that only local and regional associations are eligible to bring such litigation. For this reason, three local women registered a small social organization called Tapiola for the purpose of being able to litigate the hunting permits issued by the governments of different administrative regions. Tapiola requested courts in different Finnish regions to issue injunctions against the permits, and transfer the case to the CJEU as Finnish law was in conflict with the EU law. However, almost all the regional courts rejected these claims based on lack of standing, for example the location of Tapiola's registered office is too far from the region in question.

When the next hunting season came and the government started issuing permits again, Tapiola changed litigation strategy and divided itself into six regional organizations, hoping to meet the requirements of qualified plaintiffs. And one of the lawsuits was successfully filed in the Supreme Administrative Court of Finland. The Supreme Administrative Court of Finland sought the opinion of the CJEU on whether the wolf hunting act was legal and under what circumstances wolf hunting was permitted and whether Finland has violated EU law. Then, the case was finally transferred to the CJEU.

The CJEU gave a ruling in 2019, imposing highly stringent restrictions on wolf hunting, and essentially agreeing with the claimants on all the issues. By emphasizing the main aim of the *EU Habitats Directive* to "ensure biodiversity through the conservation of natural habitats and of wild fauna and flora", the CJEU ruled that:

①There is no clear evidence proving the said claim — issuing hunting permits can reduce illegal poaching acts.

②The government failed to confirm that no other satisfactory alternatives existed.

③The government failed to guarantee that the hunting permits will not harm well protected wolf populations in their natural range.

④The government failed to assess the potential impact on the wolves' conservation status when issuing the hunting permits.

⑤When issuing the hunting permits, the government failed to follow all the requirements stipulated under Article 16(1)(e), especially, the must-be-considered conditions: the population level, its conservation status and its biological characteristics.

Following the CJEU ruling, the Supreme Administrative Court of Finland gave a ruling accordingly, declared finally wolf hunting permits illegal in March, 2020, and asked the government to explore other effective ways to protect Finnish wolves.

Main outcomes

(1) Ecological value

The wolf once ravaged Europe. But between the Middle Ages, and the 1970s, wolves were nearly

A grey wolf in the snow (Grey Wolf Hide Photography Finland/Photographer)

extinct. In 1973, Finland joined the European Union, which meant that Finland must implement the EU directives at the national level. But in fact, the *Hunting Law* in Finland still creates convenience for hunting wolves. This case protected the wolves, top predators that are of great significance to maintaining the stability of the global ecosystem. The judgment and discussion of the European Court of Justice in this case also have important reference and application value for the European Union.

(2) Innovation

The fact that the public has the right to resort to law on environmental matters is the cornerstone of environmental justice. The plaintiffs in this case have made full use of this principle to obtain litigation status for themselves and the effective implementation of EU law at the level of member states is ensured. At the same time, the court issued injunctions in some cases, which saved the lives of some wolves during the hunting season, highlighting the importance of effective use of injunction when dealing with urgent biodiversity threats.

About the applicant: ClientEarth is an environmental law public interest organization founded in 2008. It brings together law, science and policy to develop feasible solutions to environmental challenges. ClientEarth focuses on issues such as environmental justice, green finance, climate and forests, climate and energy, health and the environment. Its office in China has established close relationship with the Chinese Government, and it supports the Chinese Government to develop strong, modern, and pluralistic environmental and climate governance, and supports China to play a leading role in global environmental governance.

CHAPTER III

Public Participation and Network

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Ant Forest

Ant Group

Approaches: Public participation; Publicity and advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity

Targets: Forest; Grassland; Mountain; Flora; Mammals; Amphibians; Avifauna

Location: China

Year of Implementation: 2016

Background

"Ant Forest", a public welfare platform dedicated to ecological conservation under the Ant Group, was in August 2016 officially launched on the Alipay platform. Netizens' low-carbon behaviors, such as green transportation, reduced use of paper and plastic, energy conservation and efficiency improvement, and recycling, can be calculated as "green energy" through carbon emission reduction methodology. When the energy accumulates to a certain level, they can apply for planting a real tree in deserted areas or "claim" one m^2 of protected area in areas where biodiversity conservation is urgently needed. After that, enterprises including Ant Group donate funds to public welfare organizations and cooperate with local forestry departments to implement ecological restoration and biodiversity conservation projects in corresponding areas.

Main activities

From 2016 to 2021, Ant Forest participated in ecological restoration in 11 provinces across China, planting a total of 326 million trees, of which more than 100 million trees are in Gansu and Inner Mongolia respectively. At the same time, Ant Forest has also set up 18 land-trust Nature Reserves in 10 provinces across the country and protected over 1,500 species of wild fauna and flora.

Under the guidance of the Office of the Executive Committee of the Preparatory Work for the CBD COP15 (hereinafter, the "Executive Committee Office for COP15"), in May 2020, Ant Forest

cooperated with China Environmental Protection Foundation in launching the "One Square Meter by Everyone, and Join Hands to Protect Biodiversity" Initiative, in which more than 100 million people participated.

Up to now, Ant Forest has driven more than 600 million people to participate in, becoming the world's largest environmental conservation public welfare platform, widely communicating the value of biodiversity conservation.

At the same time, as an Internet public welfare platform, Ant Forest provided convenient and efficient action and incentive solutions for all sectors of society to participate in ecological restoration and biodiversity conservation. In the past five years, under the guidance of local forestry and environmental departments, Ant Forest cooperated with China Environmental Protection Foundation and other non-profit organizations, and attracted nearly a thousand partners of various types to participate in, including scientific research institutions, cities, universities, brands, etc.

Main outcomes

(1) Ecological value

Site selection of Ant Forest's reserve projects focus on China's biodiversity conservation priority areas and areas that have important biodiversity conservation values but have not been included in the statutory and formal reserve system. Ant Forest's reserve projects supports

Photograph of field work of patrolmen in Wangqing Reserve of Ant Forest

Siberian tiger photographed by an infrared camera in Wangqing Reserve of Ant Forest

conservation agencies to prioritize community-based protection projects and explores protection modes that promote the harmonious coexistence between human and nature. Most of Ant Forest's 18 on-going land-trust Nature Reserve projects are located in the Giant Panda National Park, the Three-River Source National Park (TNP), the Northeast Tiger and Leopard National Park, and the surrounding areas of the reserves. It plays a positive role in the conservation of rare and endangered species such as giant pandas, snow leopards, North China leopards, Chinese mountain cats(*Felis bieti*) , Yunnan snub-nosed monkey, and crested ibis(*Nipponia nippon*) , supports the ecosystem restoration of forests, grasslands, deserts, mountains, intertidal zones, etc, and provides a useful reference for national parks to further promote community-based conservation.

Giant panda photographed by an infrared camera in Fushou Reserve of Ant Forest

(2) Social-economic value

①The Research Center for Eco-Environmental Sciences of the Chinese Academy of Sciences and the IUCN jointly issued the *Ant Forest Afforestation Project Gross Ecosystem Product (GEP) Accounting Report 2016-2020* in 2021, GEP created by Ant Forest in wind prevention and sand fixation, climate regulation, carbon fixation, oxygen release, and water conservation reaches RMB 11.306 billion.

②Ant Forest, as a public welfare project aiming at connecting people and nature, has effectively connected the public, enterprises, protection agencies and communities, and protected the ecological environment with the participation of all people.

③In the past five years, Ant Forest created 2.38 million "green" jobs across the country, motivating local villagers to participate in eco-environmental conservation projects, and increasing labor income by more than RMB 350 million.

Ant Forest won the United Nations "Champions of the Earth" and the "Lighthouse Award" in the field of climate change in 2019.

(3) Innovation

Relying on the digital technology of Ant Group and the open platform of Alipay, the Ant Forest project has formed an innovative "public welfare incentive mechanism": supporting "visible green actions" with corporate donations, and encouraging public to accumulate "invisible green actions" with low-carbon behaviors in their daily lives and participate extensively in ecological environmental conservation and green development.

In terms of the "One Square Meter by Everyone, and Join Hands to Protect Biodiversity" Initiative, the public can view precious videos and pictures of endangered wild animals in nature reserves on their mobile phones.In this way the difficulties in connecting ecological conservation with the public are solved by Internet innovation.

About the applicant: Ant Group is the parent company of Alipay, a mobile payment platform, and the world's leading open fintech platform. It is committed to promoting the digital upgrading of global modern service industry(including financial service industry) with technology, providing inclusive, green and sustainable services for consumers and small and micro enterprises, and bringing small but positive changes to the world.

54

Enhancing Social Organizations' Capacity on Community-based Conservation and Development in Myanmar

Global Environmental Institute

Approaches: In-situ conservation; Public participation

Targets: Forest; Ocean and coastal; Freshwater & wetland; Flora; Mammals; Marine creatures; Amphibians and reptiles; Avifauna; Germplasm resource conservation

Location: Myanmar

Year of Implementation: 2016

Background

The Community Conservation Concession Agreement(CCCA) is a conservation model introduced, demonstrated and innovatively improved in China by Global Environmental Institute (GEI). The basic concept is to give environmental protection rights and limited development rights in reserves to different stakeholders in the form of agreements. Since 2005, GEI has been adapting the CCCA model to pilot, improve, and innovate conservation in several western provinces in China, protecting over 150,000 hm^2 of land and benefited over 65,000 individuals.

Establishing community conservation concession Area

In 2016, GEI and four local social organizations jointly

introduced the CCCA model to Myanmar, and launched 16 pilot projects to protect 10,932 acres of land. However, during the implementation of project, GEI found out that the lagging capacity of Myanmar's environmental groups and organizations was one of the major challenges to conserve Myanmar's biodiversity.

Main activities

In 2017, GEI applied to Critical Ecosystem Partnership Fund (CEPF) for grants, seeking for support to enhance Myanmar social organizations' capacity on community -based conservation and development and to increase the impact of the CCCA model. With CEPF's supports, GEI did the following three things:

①Conducted 4 trainings and workshops for local social organizations to enhance capacity of CCCA implementation. In total over 150 environmental professionals from 4 governmental departments, 2 research institutes, 9 local social organizations and 10 international social organizations joined;

Myanmar social organizations in trainings

conservation concession protected area landscape.

②Assisted four social organizations to increase the number of CCCA pilot community to 27 with 22,264 individuals from 4,295 households participated;

③Built a platform and network for Myanmar local social organizations to communicate with governmental departments and international donors, especially Chinese charities such as SEE Foundation, Sundan enterprise, etc.

Main outcomes

(1) Ecological value

The CCCA project evaluation concluded that these projects contributed to the conservation of more land and ecosystems by communities. The conservation area protected by communities within these projects expanded to 40,890.5acres[①], which contributes to 0.024% of land cover in Myanmar, and are now protected by 27 local communities. With this small number of communities, the increasingly growing projects will contribute to 0.25% of Myanmar's commitment of expanding areas of forest protection to 10% of land cover by 2030. These projects protected five key biodiversity areas in

① 1acre≈4,067m^2.

Myanmar, covering deciduous forest, mangrove forest and wetland ecosystems. It is also good to see that most of threats were addressed by conservation actions. The evaluation also showed local communities have a good awareness of environmental issues, especially about deforestation and climate change, which demonstrated positive outcomes from awareness raising trainings from both social organizations and local forest departments. In 2018, *Conservation of Biodiversity and Protected Area Law* was passed by Myanmar Government, recognizing "Community Protected Area" as an official category of protected area.

(2) Social-economic value

22 community funds were established to support sustainable livelihoods with a capital of USD 59,318.58, providing loans to 2,267 households. On average, CCCA projects helped local communities increase their annual household income by 17% and three new livelihoods were introduced to communities. By GEI's analysis, CCCA projects are also cost effective, with over 78.2% of the participants benefiting directly or indirectly from them.

(3) Innovation

In April 21, 2017, to appreciate GEI's effort on facilitating the USD 3.3 million worth of climate aid goods donation from China to Myanmar through South-South Climate Cooperation, Forest Department of Myanmar reserved 300 cookstoves and 300 solar-powered lighting system and distributed them through local social organizations to project communities. These climate aid goods not only can promote the development of renewable energy in rural areas, but also will be used as a "stepping stone" to establish community conservation and development micro-finance fund(for short,"Community Fund") . Before the distribution, social organizations and community committees determined an underquoted price for each cookstove and lighting system and encouraged any interested resident to submit an application. After reviewing these applications, recipients will be chosen depending on their household income and personal credits. All the money collected through climate aid goods will be contributed to the Community Fund to continuously support the communities' conservation and development. By using the aid goods as leverage for community conservation and sustainable livelihoods development, GEI also intends to provide a sample operational model and experience for China's South-South Climate Cooperation Fund(SSCCF) and other potential foreign aid programs to have continuous impacts in the long term.

About the applicant: Global Environmental Institute is a Chinese, non-profit social organization founded in Beijing, China in 2004. GEI works alongside key policymakers, enterprises, scientists, civil society leaders, and local communities to protect the environment and enhance financing opportunity in China as well as in Southeast Asia, Africa, and Latin America by fostering dialogues and innovative solutions.

55

Bird Collision Prevention Citizen Science Project

Duke Kunshan University

Approaches: Public participation; Publicity & advocacy; Policy-making & implementation

Targets: Urban; Avifauna

Location: China

Year of Implementation: 2018

Background

Bird collision is usually described as a phenomenon where birds collide with artificial objects including wind turbines, electric wires, airplanes, buildings, etc., causing birds to be injured or even killed. Bird collision with buildings is considered to be the second direct leading cause of bird deaths in North America. In Canada, the number of bird deaths due to collisions with buildings is estimated to be about 25 million, while this number in the United States is between 365 million and nearly 1 billion. With the advancement of urbanization, the increase of human settlements, and the popularity of glass walls in architectural design, the risk of birds colliding with buildings may become increasingly serious.

A mugimaki flycatcher (*ficedula mugimaki*) being killed due to collision

Located on the EAAF, Duke Kunshan University is a place where migrating birds fly over every fall and spring. Bird collisions are common on campus due to the application of glass

for a large number of structures in the Duke Kunshan University. Therefore, the Bird Collision Prevention project of Duke Kunshan University came into being, which is dedicated to investigating and improving the situation of bird collisions on campus.

Main activities

Since the fall of 2018, the Duke Kunshan University project team has been conducting systematic bird collision data collection under the guidance of Professor Li Binbin every spring and fall during the migration period of birds passing through Kunshan, and used targeted measures to improve the buildings on campus such as putting stickers on large transparent glass walls. Such measures have proved to be effective in long-term monitoring as the frequency of bird collisions has been significantly reduced.

The Duke Kunshan University project team and China Youth Climate Change Action Network(CYCAN) cooperated with the Chengdu Bird Watching Society to plan the expansion of the bird collision project to the whole country at the beginning of 2021, and the Duke Kunshan University project team established a cooperative relationship with the Shanghai Natural History Museum in March of the same year to recruit volunteers. As of the completion of the volunteer recruitment, there were about 400 individual volunteers and nearly 50 volunteer teams coming from 31 provinces and cities across the country participated in nationwide projects.

The first national project started in

Bird collision prevention stickers on the corridor of DKU's dormitories

Presentation at Shanghai Natural History Museum in spring of 2021

February 2021 and lasted until June 6. The data from the citizen science survey will be used to guide local building renovation and urban design recommendations. So far, the existing data has been helping Duke Kunshan University, Futian Mangrove Forest Park, and other institutions in carrying out protection and intervention measures. In the future, nationwide bird collision investigations and actions will continue.

Main outcomes

(1) Ecological value

Among the important migratory bird flyways in the world, the three major flyways of West Asian-East African, Central Asian,and East Asian-Australasian pass through China and cover almost the entire territory of China. Densely populated Chinese urban areas such as the eastern coast, the North China Plain, and the Chengdu Plain may pose a greater risk of injury or death from collisions with man-made buildings for migratory birds. Therefore, research on bird-building collisions in China is of important practical significance for bird protection worldwide.

(2) Social-economic value

As a nationwide citizen science project, this practice has been widely welcomed by the public as it combined urban biodiversity surveys, bird watching and other natural hot topics of social concern.

In addition to Duke Kunshan University, the practice partners include Chengdu Bird Watching Society, Shanghai Natural History Museum, China Youth Climate Action Network (CYCAN) and other institutions that have also carried out effective publicity and mobilization work in their respective cities and networks. It is believed that the social impact of this practice will be further expanded in the future.

(3) Innovation

Before this practice, there has never been a similar nationwide investigation.

Bird collisions have been recorded all over the country. The students and professors of Duke Kunshan University, as the group that first noticed bird collisions in China, began systematically recording bird collisions on campus in the fall of 2018, which has been continued for nearly three years as of 2021. This provides an important scientific basis for evaluating bird collisions across the country and fills up the gaps in this field.

About the applicant: Duke Kunshan University, jointly founded by Duke University in the United States and Wuhan University in China, was officially approved by the Ministry of Education of China in September 2013. It is a university featuring general liberal arts education. It is located in Kunshan City, Jiangsu Province, China, adjacent to international metropolises Shanghai and Suzhou, and provides students from all over the world with a series of high-quality innovative academic projects such as environmental science and global health.

56

Snow Leopard Protection by Volunteers and Communities in the Eastern Tianshan Mountains

Wilderness Xinjiang

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Financial support mechanisms

Targets: Mountain; Mammals

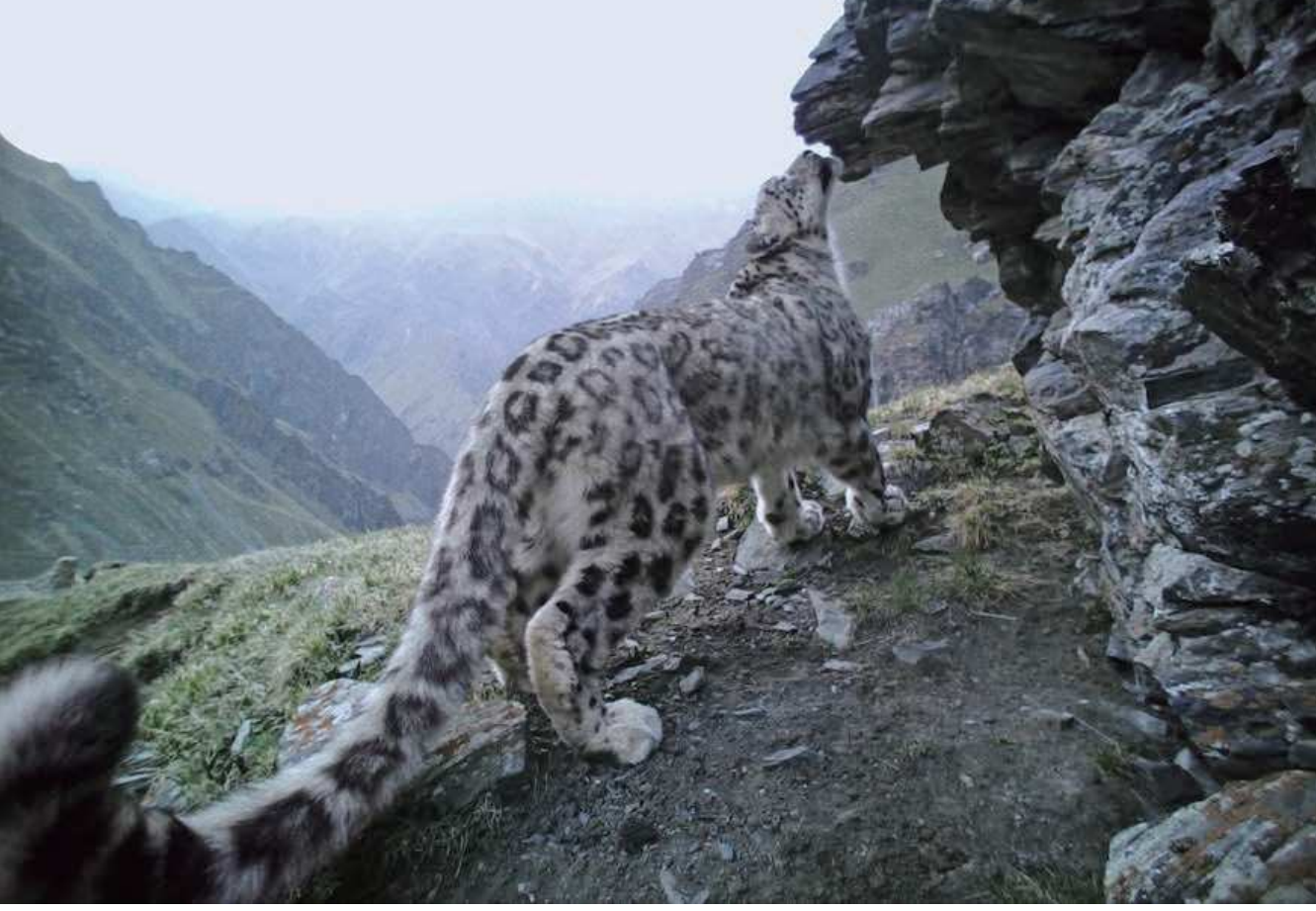
Location: Urumqi, Xinjiang Uygur Autonomous Region, China

Year of Implementation: 2014

Background

Situated in the heart of Eurasia, Urumqi is at the northern foot of the middle section of the Tianshan Mountains and the southern edge of the Junggar Basin. Within Urumqi, a unique natural landscape integrating glaciers, mountains, forests, grasslands, rivers, deserts, and Gobi is presented. However, Urumqi was faced with different problems including severe damage to natural vegetation, animal habitats, and habitats of wildlife, weak capabilities in urban biodiversity management and insufficient investment in nature conservation in the process of urban development.

Since 2014, Wilderness Xinjiang has been monitoring local snow leopard populations in the Nanshan area of Urumqi, and with the support of the State-owned Forestry Administration of the Eastern Tianshan Mountain in Xinjiang Uygur Autonomous Region, together with the Administration's sub-bureaus, the People's Government of Saerdaban Township, Xueliangu Community, Urumqi County Education Bureau, Bridge and Tunnel Engineering Company Limited of China Communications Construction First Highway Engineering Bureau, and SEE Foundation-Silk Road Center. It has set up the Urumqi River Snow Leopard Protected Areain in the Nanshan snow leopard project site, including a monitoring and protection station and Xinjiang snow leopard protection area.



A snow leopard photographed by infrared camera

Main activities

The following activities have been carried out in the snow leopard protection area:

①A front-line patrol and monitoring team made up of local herdsmen has been built in the project area based on CCCA and the continuous efforts on capability building. Independent routine patrol and scientific monitoring on snow leopard habitat have been carried out, and the community, with assistance from the project, has set up a database on each snow leopard as well as videos and pictures of the animal.

②Joint meetings attended by competent protection authorities, community representatives, and social organizations were held regularly to facilitate the interaction between local communities, government departments, and the general public. Mechanisms for patrol and monitoring evaluation, illegal incident response, and patrol staff incentivization have been established and implemented.

③Activities for exploring wildlife-friendly livelihoods, annual community activity "Snow Leopard Conservation Day", wildlife photo exhibitions, and snow leopard protection classes were organized at the project site to raise the communities' awareness of snow leopard conservation. At

present, each snow leopard has its own name, and each of the four breeding families has its own stories, which greatly increased the friendliness of the public for snow leopards in the process of communication.

④The city's volunteers and general public were guided to participate in the nature educational sessions by disseminating protection stories on the project site via online and offline activities, so as to help reduce human-animal conflicts in the community.

⑤Public education sessions on natural science have been carried out in the city of Urumqi and policy advocacy has been performed, thus creating the ecological business card of "City of Snow Leopard".

Main outcomes

(1) Ecological value

①Government-led protection actions and policies have been developed through this project, enhancing the protection forces for snow leopard habitat in an area of 600 km^2. Local community patrol and monitoring networks have been able to independently carry out routine patrol and scientific monitoring of the snow leopard habitat; hunting traps in the project site are no longer seen while disorderly activities by people coming from outside have been significantly decreased, thereby effectively reducing the threat of poaching and habitat disturbance.

Joint patrol team of snow leopard protection area

Sustainable livelihood development based on volunteer linkage—free-range chicken project

②It promoted study on such blank areas of the snow leopard as the Altun Mountains protected area, the East Tianshan Mountains(Hami) and South Tianshan Mountains(Kezhou) , cultivating the monitoring capabilities of local forestry staff and volunteers and empowering the protected area to build lasting study and monitoring abilities.

(2) Social-economic value

A preliminary brand of nature research and eco-tourism has been formed. In particular, wide media coverage facilitated the public' awareness of the "City of Snow Leopard". CCTV documentaries on this project such as *I'm from Xinjiang*, *I'm Going to Xinjiang*, *Captain of China*, *Guardian of the Wilderness*, *Eyes on Wilderness Predators*, *Chinese Volunteers*, and *The Wilderness First* have got over 100 million hits online, attracting more ordinary people to participate in nature conservation and become new nature conservation forces.

About the applicant: Wilderness Xinjiang is a public welfare organization based on volunteer community, dedicated to the popularization of nature conservation science. It was initiated in 2012 by local nature exploration enthusiasts and protection action volunteers in Xinjiang and officially registered in 2017. It is the organization's wish to keep natural conservation within reach. It hopes to achieve a better self and create a more beautiful home through the participation of natural conservation.

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Citizen Science Based Database for Bird Conservation

China Birdwatching Association

Approaches: Public participation; Publicity & advocacy; Technological innovation

Target: Avifauna

Location: China

Year of Implementation: 2014

Background

Birds are an important part of natural ecosystems, the species, distribution and population dynamics of which are important indicators to reflect the status of the whole ecosystem. Understanding of the status and changes in the populations of various bird species relies on data as a basis. However, wildlife conservation has been kept at a relatively rudimentary stage due to the lack of a digital concept in the overall governance and the lack of regular monitoring and corresponding databases. It is not enough to collect and sort out these data only by scientists and forestry departments, and it has to be effectively supported with citizen science.

Crested ibis (Wei Ming/Photographer)

Main activities

Since the late 1990s, birdwatching activities have been booming in China,

Gallery of China Birdwatching Record Center

generating a large amount of bird observation data. And the PC-based "Bird Talker", a Chinese bird record center, was launched in late 2002 as a platform for birdwatchers to submit and inquire about bird records.

The China Birdwatching Association took up the responsibility for the construction and maintenance of the database in 2014 and renamed "Bird Talker' as "China Birdwatching Record Centre" (www. birdreport. cn) , rebuilt the database structure and adopted a new bird classification system to provide users with daily bird observation record collection and query statistics. The mini-program of "Birdwatching Record Centre" was launched in 2020. In 2020, a mobile webpage was also launched in addition to the PC webpage.

There are now nearly 15,000 active users, including birdwatching enthusiasts, researchers, and frontline nature conservationists. 1,321 species of birds distributed in China and 71.44% of the country's county-level administrative areas are recorded. The database technical support team has also worked with professional organizations to optimize the underlying data architecture, embed big data algorithms, and formed a bird data-based model algorithm combined with the manual audit to regularly update the national bird distribution map.

China Birdwatching Association also works with relevant scientific teams to share the scientific value of data, and promote the sharing of information for national wildlife authorities and international conservation platforms to provide scientific and technical support for bird conservation.

Main outcomes

(1) Ecological value

After nearly 6 years of efforts, citizen science data from the China Birdwatching Record Centre has contributed to the identification of critical habitats of the most endangered species in China and distribution hotspots for endangered birds, facilitated the design of the project, "Free Flying Wings", with SEE Foundation, contributed to the application of a series of world heritage sites for migratory birds in the Yellow and Bohai Seas in China, and become the basis for the development of China's first local standard for bird diversity and habitat assessment(Beijing Local Standard: *Technical Regulations for Bird Diversity and Habitat Quality*) .

(2) Social-economic value

①Since 2015, research institutions(such as Peking University, Tsinghua University and Beijing Forestry University) have cooperated with the China Birdwatching Association to use the data accumulated by the China Birdwatching Records Centre for analysis, and published a series of research

papers related to bird conservation, providing important references for making bird conservation decisions in China.

② In 2019, China Birdwatching Association implemented the "National Bird Diversity Assessment" project commissioned by the Chinese Research Academy of Environmental Sciences, which provided the ecological and environmental authorities with basic data on bird diversity for the first time, and put forward some issues that should be given priority in the conservation of bird diversity in China in the future.

Citizen science survey

③In 2021, based on the data from the Record Center, China Birdwatching Association, together with other birdwatching organizations in China, published the *China Birding Report 2020*, identified areas with high diversity of bird distribution and priority areas for the conservation of endangered birds and proposed a set of bird diversity evaluation indexes based on public data, and conducted a pilot evaluation.

④As a public welfare data sharing platform, the China Birdwatching Record Center is playing an increasingly important role in the modernization process of natural and ecological environmental conservation in China, where citizen scientists represented by birdwatching enthusiasts participate in and promote the conservation of natural and ecological environment.

(3) Innovation

As a database targeting all bird observation data across the country, the China Birdwatching Records Centre has now achieved a closed loop of data collection, data storage, data analysis, and data sharing. It is currently China's most comprehensive and complete bird database created by a social organization, as well as one of China's most comprehensive and complete bird databases in terms of functionality.

It is also an innovation in China to sort and analyze citizen science data based on this database and to form scientific reports, policy recommendations and industry standards related to bird conservation.

About the applicant: China Birdwatching Association, also known as the "Joint Action Platform of China's Birdwatching Organizations", was established in 2014 and is a private non-enterprise organization. It is committed to building a platform for cooperation between bird-watching organizations and all sectors of society, and promoting bird and nature conservation in an in-depth and multi-faceted way through public science.

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The Bird Observatory —A Community-based Biodiversity Conservation Approach on the Migratory Bird's Flyway

The International Birding and Research Center, Eilat

Approach: In-situ conservation

Target: Avifauna

Location: Israel

Year of Implementation: 1993

Background

Eilat, the only land bridge connecting Europe, Asia and Africa, is a bottleneck that serves as a flyway for millions of migrants. These birds are preparing themselves for the challenging task of crossing the hostile and foodless Sahara Desert. Eilat used to be an expansive saltmarsh that was the last "fueling station" before the bird's epic desert journey. However, the area has suffered human development resulting in very little of this important habitat remaining.

Currently, most stopover sites for birds are manufactured habitats such as fields, orchards, gardens, sewage reservoirs and saltpans. These habitats are unsafe and have conditions far from those optimal for the migrants. The natural open spaces more suitable for stopover are being claimed for development. One method for improving bird habitats is to go through cooperation with the habitats' owners and managers.

Main activities

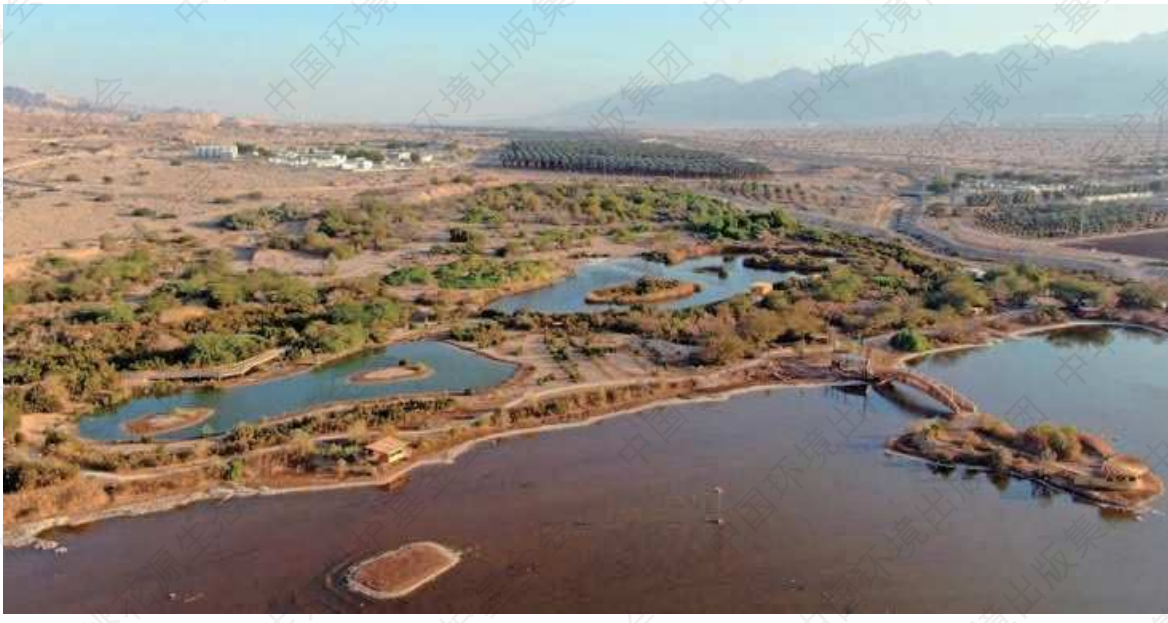
The bird observatory is a community-based biodiversity conservation approach on the migratory birds' flyway. The International Birding and Research Center, Eilat(IBRCE) built the bird sanctuary as a replacement habitat for migratory birds. The bird sanctuary is mostly a hub for environmental culture and runs large community events where local participants can enjoy birds and hear how they can

support the campaigns for the birds and make a change. Their volunteers help with the usual work of bird ringing, maintenance, and bird surveys as well as other various campaigns. They also have a significant impact on the state of the migratory birds in the sanctuary and its surrounding area. A good example is IBRCE campaigned against a plan to build a wind farm between the most important stopover sites of migratory birds which actually successfully stopped the wind farm construction.

IBRCE dedicates itself to the becoming of a renown source of knowledge. For example, a plan to build an antenna held by cables (which created a severe danger for bird collision) was changed to a friendlier pylon for birds by the city architect, following IBRCE's advice. A policy of a maximum of 50% glass fronts of buildings in new neighborhoods to prevent bird collisions was another result of IBRCE's impact.

A sewage engineers also recruited IBRCE's help to make the main sewage reservoir a safer and better stopover site for birds. IBRCE helped the water company identify hazards for birds and opportunities to improve the site, made a detailed plan with the assistance of a planning team, implemented what IBRCE could with its own resources and fundraise for a larger project that will make it a prime site for birds.

IBRCE additionally conducted an educational program within agricultural communities regarding ecological system services and how to enhance them to improve people's lives.



The Eilat Bird Sanctuary IBRCE from Above – "If I were a migratory bird, I would have landed"
(Yuval Dax /Photographer)

A Eurasian Bee-eater(*Merops apiaster*) taking off for another day of migration, from the safe-haven of the Bird Sanctuary IBRCE (Noam Weiss/Photographer)

Main outcomes

(1) Ecological value

In years when food for the birds is scarce before or during the crossing of the Sahara Desert, the sanctuary (which is surrounded by extremely arid desert) becomes a crucial stop on bird's journeys. More than 450 species of birds have been recorded at the bird sanctuary, most of them migrants. Among these birds are the common European and Asian migrants but also endangered species like the turtle dove(*Streptopelia turtur*) , the steppe and greater spotted eagles(*Aquila nipalensis*) (*Clanga clanga*) , lesser falcon(*Falco naumanni*) , Egyptian vulture and many more.

The community-based conservation plan created a masterplan for the main stopover sites in the region and works with the community and the authorities to make these habitats a nutritious and safe site for millions of migratory birds.

(2) Social-economic value

Community-based nature conservation benefits nature as well as society. The activities of the IBRCE at the bird sanctuary created a variety of services for the local community: running volunteer programs that involve large groups of people; running environmental educational programs at the bird sanctuary and in the local school; conducting environmental community events five times a year which attract thousands of people; keeping the bird sanctuary an accessible place for all by allowing free entrance.

A community event at the Bird Sanctuary IBRCE–Protecting the Greater Flamingo of Eilat is Fun (Noam Weiss/Photographer)

The IBRCE also supports vulnerable groups of the local community by providing volunteers and educational programs for mentally or socially challenged people.

Eco-tourism of wildlife and bird watching is also a growing business in town, following IBRCE's conservation, awareness and marketing efforts. In 2019 IBRCE hosted the 3rd International Bird Observatories Conference in Eilat and at the bird sanctuary.

(3) Innovation

Rather than a scientific approach to conservation of open landscapes the bird observatory takes the approach of using civil participation and public support as the main mechanism for change. All activities are done in full transparency, participation and involvement of the local community and for the community.

The concept of a bird observatory exists primarily in developed parts of the world. Nevertheless, the concept can be easily used in developing countries. It does not have to be large, it can be done on a very small scale but with a large impact, as long as it combines some of the elements of the work of a bird observatory.

About the applicant: The International Birding and Research Center, Eilat(IBRCE) is a social organization protecting birds. The IBRCE manages the Bird Sanctuary and runs programs to support conservation of the migratory bird's flyway. It focuses on habitat restoration, nature conservation campaigns, research that supports conservation efforts, environmental education programs at the bird sanctuary and beyond, eco-tourism for nature lovers and professional birders and community work.

CHAPTER IV

Publicity , Advocacy and Education

59

The Immersive and Interactive Game "What is a Diverse Planet"

L'Oréal(China) Co., Ltd.

Approaches: Public participation; Publicity & advocacy

Target: Biodiversity

Location: Shanghai, China

Year of Implementation: 2021

Background

The difficulty in spreading knowledge about biodiversity is how to spread it in an interesting way. Under the background of CBD COP 15 being held in China, L'Oréal (China) Co., Ltd. (hereinafter, L'Oréal China), in line with the 2030 sustainable development strategy of "L'Oréal for the future", has engaged in cross-cutting cooperation with Shanghai Natural History Museum, and jointly developed the project of science popularization focusing on the knowledge of biodiversity — the large-scale immersive and interactive game called "what is a diverse planet".

Scene of the large-scale immersive and interactive game "what is a diverse planet"

Main activities

Inspired by the most popular "room escape game" and "murder mystery game" among youngsters today, the game is a pioneering attempt to break the clear distinction between casual games and serious knowledge, promoting

science-based biodiversity conservation among the public.

The game "What is a diverse planet" is positioned as a 2.5-dimensional game which is the form of dimension with the joint interaction between 2.0 and 3.0 dimensions, and the form in which the real and virtual digital world co-exist. The public learn about the history of biodiversity from the background story of the game by starting the corresponding mini program on their mobile phones at the Natural History Museum, and then select corresponding animal roles and taking part in the immersive script to experience interactive games.

The public will travel online as animals and go to different areas of the Natural History Museum under the guidance of mini programs to fulfil multiple offline physical tasks such as finding physical animals and listening to animal sound with installations. By integrating online and offline experience, people can understand the knowledge about animals' habitat and food chain as well as biodiversity in future. In addition, it could promote the dissemination of the idea of biodiversity conservation and sustainability.

The developers hope to disseminate the knowledge on biodiversity conservation in a pleasing and innovative way by providing the immersive science game, appeal to all people to learn and participate in the conservation of biodiversity and build a diverse planet.

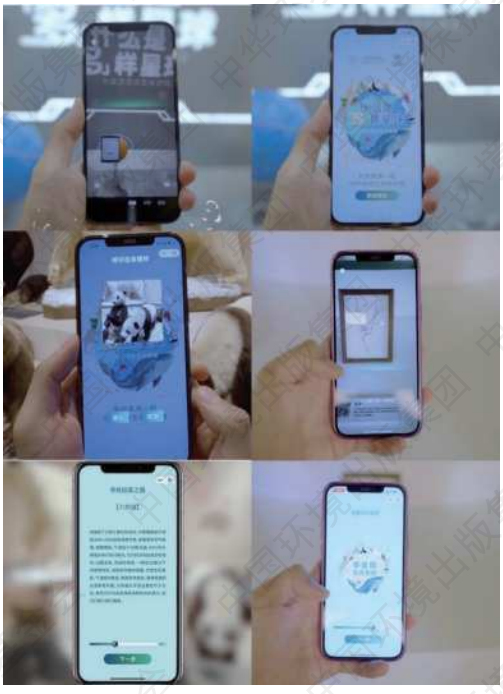
Main outcomes

(1) Social-economic value

The large-scale immersive and interactive science game "what is a diverse planet" provides an attractive immersive experience education model by a cross-border way of deep integration of science, art and technology, and this science game was released in Shanghai Natural History Museum between July 28 and August 31, 2021, which has attracted over 20,000 people to participate in the offline activities.

(2) Innovation

This science game is an innovation of biodiversity science education, which overcame the difficulty of biodiversity public education by taking advantage of the rich collection of resources in the Natural History Museum, empowering the public



Process experience of the large-scale immersive and interactive game "what is a diverse planet"

Master visual design of the large-scale immersive and interactive game "what is a diverse planet"

in an innovative way, and creating a new form of "cross-border collaboration". As a result, it became a good example for promoting the popularization of biodiversity. At the same time, the game serves the media needs of the current communications. It not only follows the rules of information transmission in the era of digital information, but also stresses the significance of personal participation. In so doing, people can learn scientific knowledge in the game.

About the applicant: L'Oréal Group is the largest cosmetics group in the world. Since it entered China in 1997, China has become its second largest market after 24 years of development. At present, L'Oréal has a North Asia headquarters, an Asia-Pacific operation department, an innovation and R&D center, a training center and two factories in China, and manages and operates 28 well-known international and local brands. With the increasingly severe environmental and social challenges, L'Oréal Group is accelerating its transformation to create a more sustainable and inclusive development model that respects the rules of the earth. In 2020, the Group launched a brand-new sustainability project "L'Oréal for the future".

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Pangolin Protection

WildAid Beijing Representative Office

Approach: Publicity and advocacy

Target: Mammals

Location: China

Year of Implementation: 2016

Background

Pangolins are the world's most heavily affected wild mammals by illegal trade. The IUCN estimates that at least 1.1 million pangolins were killed from 2006 to 2016, which was driven by demand for their scales and meat. Consequently, all 8 species of pangolins were upgraded to class I species listed in the Appendix of the CITES at the end of 2016. International trade in all pangolin products and body parts is banned. The Chinese pangolin (*Manis pentadactyla*), which is distributed in China, has been classified as "Critically Endangered" (CR) by the IUCN Red List of Endangered Species due to excessive hunting and utilization.

Main activities

WildAid was the first nature conservation agency to launch a pangolin protection project in 2016, the goal of which is to reduce pangolin products consumptions and pangolin poaching, and to raise public awareness of pangolin protection and its protection levels. From 2016 to 2019, WildAid has continuously tracked domestic and international events related to pangolins. With the influence of celebrity ambassadors, the pangolin has gradually become a new "iconic" species for wildlife and biodiversity conservation,and pangolin-related issues have become the mainstream information of major media attention.

On the Pangolin Day in 2016, WildAid and Guoke jointly released the first pangolin public educational animation, which was viewed more than 6 million times, and launched the pangolin

protection project.

WildAid launched its first public-interest ad to protect pangolins in May 2016.

All pangolins were upgraded to CITES I at CITES COP17 in September 2016. WildAid seized this opportunity and published its second public-interest ad for pangolin protection on Weibo, which was viewed more than 27 million times on Miaopai.

In 2017, WildAid invited a famous actor to feature in a public-interest ad for pangolin protection titled *One Trick to Defeat the Enemy*, which attracted attention from the Weibo account of People's Daily. In August, WildAid released this public-interest ad, which was simultaneously published on People's Daily's Weibo account and received more than 8,000 times of forwarding and 27,000 likes.

Public service advertisement taken in Chongqing City Square in 2020 regarding upgrading pangolin to class- I national protected animal

At the end of 2017, WildAid released a public-interest ad for pangolin protection, *the Honeytreasure Story*, which was simultaneously released on People's Daily's Weibo account and Angelababy's Weibo account. *Honeyhoney's Story* has been forwarded more than 140,000 times and received more than 260,000 likes.

In December 2018, WildAid released a public-interest ad for pangolin protection called *Mother's Love*, which sparked heated online discussions.

In August 2019, the National Forestry and Grassland Administration revealedthe plan to carry out relevant study and promote pangolins from class-Ⅱ national protected wild animal to class-Ⅰ. WildAid has teamed up with People's Daily WeChat account and NetEase City Tour to develop a strip cartoon on pangolin protection to promote the protection class upgrading of pangolin.

On Pangolin Day in 2020, a strip cartoon titled *Actually*, *You Know How to Do* was published on People's Daily's WeChat and was viewed 1.69 million times and 89,000 people chose the "viewing" status for the cartoon.

In 2020, pangolin was officially upgraded to class-Ⅰ national protected animal.

Main outcomes

(1) Ecological value

Obvious results have been achieved through the practice of "Conservation through Communications" by WildAid. After several years of communication, news of sporadic occurrence of the Chinese pangolin population began to appear in media reports.

(2) Innovation

Actually, *You Know How to Do* originally is a vertical scroll especially suitable for mobile phone WeChat, which was very popular after being released on the account of People's Daily on WeChat. The pangolin was officially upgraded from class-Ⅱ national protected wild animal to class-Ⅰ in 2020. Taking this opportunity, WildAid adapted *Actually*, *You Know How to Do* into giant posters for subway tunnels, which have been deployed in many subway channels in Chongqing, Fuzhou, Guangzhou, and Shenzhen to further promote the new law to the public.

About the applicant: WildAid, a non-profit international environmental conservation organization, passes on the idea of refusing to consume endangered wild animals and green life to the public through the mode of "Conservation through Communications", and changes unsustainable consumption and lifestyle, so as to achieve the long-term goal of protecting biodiversity and coping with climate change. WildAid began to work in China in 2005, and established a Beijing representative office in 2017.

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Natural Science Promotion for Ecological Conservation of Yangtze River

Chuanbei Education Technology (Nanjing) Co., Ltd.

Approach: Publicity and advocacy

Target: Species diversity

Location: Nanjing, Jiangsu Province,China

Year of Implementation: 2020

Background

As the flagship species in the Yangtze River Basin, the Yangtze finless porpoise(*Neophocaena asiaeorientalis*) is the only freshwater finless porpoise in the world. Finless porpoise can be divided into three species: Yangtze finless porpoise, East Asian finless porpoise(*Neophocaena sunameri*) , and Indo-Pacific finless porpoise(*Neophocaena phocaenoides*) . Except for the Yangtze finless porpoise, the other two species are marine finless porpoises. Known as the "Living Fossil" and the "Panda in the Water" of the Yangtze River ecology, the Yangtze finless porpoise has lived on the earth for 25 million years, and became the last remaining cetacean in the Yangtze River after the functional extinction of the Baiji dolphins (*Lipotes Vexillifer*). But its quantity is decreasing year by year. In 2013, it was listed as an critically endangered species on IUCN Red List. According to the results of a scientific investigation in 2017 which focuses on the ecology of the Yangtze finless porpoise, the quantity of the Yangtze finless

Yangtze Finless Porpoise Science and Education Center – 6D drifting boat experience project

porpoise is about 1,012, which means that it is more endangered than the giant panda. The extinction of the Baiji dolphin has sounded an alarm to human beings. The Yangtze River finless porpoise will face functional extinction in 10～20 years if the ecology of the Yangtze River can't be improved. On February 5, 2021, the Yangtze finless porpoise was officially upgraded from national class-Ⅱ national protected wild animal to class-Ⅰ.

Main activities

Nanjing is the only city in China that has stable populations of Yangtze finless porpoise in the Yangtze River cross city center. In January 2014, Nanjing city proposed to protect the finless porpoise, and in September, Jiangsu Provincial Government approved the establishment of Nanjing Yangtze Finless Porpoise Nature Reserve.

In order to enable more people to know Yangtze finless porpoises, as well as to get a new perspective of the Yangtze River and the beautiful city of Nanjing through Yangtze finless porpoises, Chuanbei Education Technology (Nanjing) Co., Ltd. established the Yangtze Finless Porpoise Science and Education Center in Jiangxinzhou Subdistrict, Jianye District, Nanjing, which is also the place where the Yangtze finless porpoises usually gather. The Company made full use of its unique geographical advantage to promote the education of awareness to protect the Yangtze River, and the concept to protect the Yangtze finless porpoise. They invited scholars from their expert database to arrange the contents of the "Yangtze Finless Porpoise Science and Education Center" in terms of the geography and landforms of the

Visiting the Yangtze Finless Porpoise Science and Education Center

Display of specimens in Yangtze Finless Porpoise Science and Education Center

Yangtze River, distribution of animals and plants, water environment science, protection of endangered species and biodiversity, and ecological conservation. They also actively publicized the protection of aquatic life in the Yangtze River, strengthened public welfare communications and education, promoted the protection and development of the fishery and cultural heritage of the Yangtze River. These actions helped citizens better understand the historical, cultural, and ecological values of rare hydrobionts and their habitats in the Yangtze River Basin, and helped to create a favorable environment for the whole society to care for and support the protection of the Yangtze River.

Main outcomes

(1) Social-economic value

Since the opening of the Center, there have been more than 20,000 visitors and 10,000 groups. Nearly 7,000 people have followed its social media, with total visits of more than 20,000. The "Yangtze Finless Porpoise Science and Education Center" has become a beautiful "tourist destination" of the city. The venue actively engaged in foreign exchanges and cooperation, and has hosted leaders and organizations of provinces and cities at all levels, Singapore Ambassador to China, Consul General of Singapore in Shanghai and many other diplomatic officials, and won wide acclaim and praise from all walks of life.

(2) Innovation

The Yangtze Finless Porpoise Science and Education Center has arranged a series of programs, such as display of physical specimen, illegal fishing gear, finless porpoise protection and rescue, scientific knowledge in the Yangtze River Basin as well as experience of experiment on the water sample to restore the look of the animals in nature, so that visitors can increase their knowledge and become interested in precious species. In terms of the design concept, the exhibition hall integrates multimedia interactive technology and sensory experience, and creates a modern and innovative high-tech science-promotion exhibition hall through intelligent, visual, human-oriented, digital, international, scientific, and technological means, so as to enhance environmental conservation awareness of teenagers and stimulate them to pursue a life of science and technology.

About the applicant: The Yangtze Finless Porpoise Science and Education Center established by Chuanbei Education Technology (Nanjing) Co., Ltd. focuses on promoting the education of awareness to protect the Yangtze River and the concept to protect the Yangtze finless porpoise, and constructs the contents of the exhibition hall from the aspects of the geography and landforms of the Yangtze River, distribution of animals and plants, water environment science, conservation of endangered species and ecological conservation. It combines scientific research with public education, and organically integrates the scientificity, foresight and interactivity of the contents, and is committed to building a professional place for the general public to learn the knowledge of the Yangtze River finless porpoise.

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Community Snow Leopard Festivals

Public organization Kudak va Jomea

Approaches: In-situ conservation; Publicity & advocacy; Sustainable use of biodiversity; Access and benefit-sharing of genetic resources; Traditional knowledge

Targets: Mountain; Mammals

Location: Tajikistan

Year of Implementation: 2015

Background

The snow leopard is a rare wild mountain animal included in the IUCN Red Data Book. In Tajikistan, the remote areas close to the snow leopard's habitat, show frequent appearance of snow leopards yet also recorded high and constant poaching.

Main activities

Members of the public organization "Kudak va Jomea" in an alliance with the non-governmental environmental organizations "Kuhhoi Pomir"(Pamir Mountains) and "Kuhsori Badakhshon"(Mountain Badakhshan), initially as an initiative group for the first time in the Republic of Tajikistan, began to conduct environmental cultural and educational events-community snow leopard festivals, to involve mountain communities in the careful conservation of endangered mountain goats, sheep and snow leopards.

Through snow leopard festivals under the general theme "Man, Culture and Nature", government, public, commercial and international organizations promote conservation by various activities including performances, literatures, handicrafts, drawings, folk songs and games etc.

Many children, youth and adolescents in the pilot sites deeply understood their role in protecting and preserving local nature with all its riches; The project allocated computers, professional cameras and smart TVs to schools, helped them set up snow leopard corners and biodiversity and biocultural rooms.

Main outcomes

(1) Ecological value

The festivals activated local communities in remote places, located near the snow leopard habitat, indigenous cultural practices, around the protection, conservation and preference of wildlife; People in these places began to think about establishing public control over the local wild fauna and flora, over illegal and unconventional hunting; There are more calls from local people in remote areas for respectful, wise and balanced use of the faunal resources of local ecosystems; There is a decrease in the risks and threats of destruction of wildlife and destruction of biological diversity in pilot sites; Local people rallied against poaching; Many people have learned that the existence of a snow leopard in a single place is a sign of the purest ecosystem of the area; Ecotourists come to visit.

Folk songs and dances carried out by local residents

(2) Social-economic value

The festivals are not only shows or a good market for selling local products, but also the best platform to quickly and easily disseminate useful information in the protection of wild rare animals. People realized that the wild nature that surrounds them is the main treasure of the area, the guarantee of the prosperity and sustainable development of the region.

Pilot community applied to the government of the Republic of Tajikistan to create a fund to help victims of attacks by predatory animals on domestic animals; More people care about the use of local natural resources, the security, viability and restoration of culturally significant species of the Pamir fauna such as argali(*Ovis ammon*) , wild goat (*Capra aegagrus*) and snow leopard.

A huge amount of information about the snow leopard has appeared in the form of a flock, TV and radio broadcasts, films, books, brochures, paintings, photographs, drawings, handicraft souvenirs, creating a positive image of snow leopards among the population: they are not "criminals"nor "violators", but the rarest and most valuable animal of the Pamirs. The snow leopard must not go down, must be saved.

(3) Innovation

The practice of hosting community snow leopard festivals is unique in Tajikistan and other snow leopard range communities. Each event was able to collect more than 4,000 thousand spectators. Thanks to the festivals, the good old folk traditions of performing hunting songs, mountain dishes and drinks, ancient chants and dances, exhibitions of products of folk craftsmen were revived, which enriched the content of the festivals.

One of the goals of the Wildlife Festival is to attract ecotourists to the mountainous regions of Tajikistan to increase the socio-economic revenue of the population, where, in addition to the unique nature, the ancient traditions of the highlanders, including the traditions of protecting and preserving nature, have been preserved.

About the applicant: Pursuing social, civic, educational, legal, spiritual, cultural, ecological, economic and charitable goals, the Public Organization Kudak va Jomea takes an active part in supporting civil initiatives aimed at maintaining and strengthening spiritual and spiritual values, protecting and preserving the cultural values of the mountains. The identity of its population, the resolution of various conflicts, natural risks and natural disasters, economic and political problems that impede the sustainable(balanced) development of the mountainous Pamirs, the unification of local intellectual potential, material and financial resources, organizational capabilities.

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Denglong Yunhe Forest School

Danba County Denglong Yunhe Education Consulting Co., Ltd.

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Sustainable use of biodiversity; Traditional knowledge

Targets: Forest; Farmland; Mountain; Flora; Mammals; Avifauna; Germplasm resource conservation

Location: Danba County, Sichuan Province, China

Year of Implementation: 2015

Background

Located in the middle-eastern part of Danba County, in an area of low-latitude and high altitude above sea level, Moerduo Hill Township is a region intact in forest ecosystem and rich in biological resources, where national rare vegetation and protected animals are found, with a high degree of species diversity. Since 2014, Moerduo Hill Township has carried out the planning and promotion of the local eco-tourism industry, but encountered various problems in tourism development.

Main activities

Danba County Denglong Yunhe Education Consulting Co., Ltd.(hereinafter , "Denglong Yunhe") planning team formulated a sustainable tourism planning and design plan for Zhonglu Tibetan Village, in which the Forest School project is one of the infrastructure projects. As an innovative education center based on the local ecology and community, the Forest School facilitates the transformation of local natural resource value by promoting the educational travel model, and drives the local Gyalrong Tibetan Community to develop for the better, exploring the way to achieve a balance between conservation and development.

①Relying on the professional support of R&D(research and development), design and camp mentor teams, the Forest School developed local ecological travel and educational travel projects, and established the School Seed Museum as the site for scientific research and educational travel, which

Night view of Denglong Yunhe Forest School

promoted the research and science popularization of local forest ecosystem conservation: it has identified more than 220 species of plants and more than 110 species of birds and insects, and planted more than 550 species of plants. So far nearly 2,000 students from more than 14 countries have visited and participated in the local forest school courses.

②The Forest School has gradually formed a co-creation mechanism with the community in the process of promoting local eco-tourism and educational travel. It promoted the establishment of rural tourism cooperatives in the local area, drove local community residents to develop a series of empowerment projects brought by research tourism, such as providing tourists with catering services of local specialties, accommodation services, and community guided tours. In order to ensure that an eco-friendly model can be formed in the local area, the Denglong Yunhe team conducted a series of rural eco-tourism training for more than 240 villagers with the support of the local tourism bureau.

③The Forest School has reached a conservation agreement with the local community. The former promises to promote the development of the local collective economy, and cultivate the villagers" awareness of environmental conservation and tourism service capabilities; while the local cooperative promises to make rational use of natural resources, stop logging, poaching, grazing, mining and other activities by non-locals, and organize members to participate in forest ecosystem conservation actions and ecological education activities.

Main outcomes

(1) Ecological value

The establishment of the Forest School effectively protected the forest ecological resources and traditional culture in Xiarenyi Village, Moerduo Hill Township, Danba County, standardized the utilization of land and forest resources by community residents, and improved the effectiveness of conservation.

(2) Social-economic value

Since the establishment of the Forest School research and education base, Denglong Yunhe team has empowered the development of local rural tourism and promoted the development and value realization of ecological products. After nearly 6 years of practice, the Forest School has developed a close relationship with the community of Xiarenyi Village, Moerduo Hill Township, providing 1,220 local job opportunities, bringing an income of RMB 4.1 million to the community within three years, and increasing the average income per household from RMB 3,000 to RMB 12,000.

The Forest School, as an innovative education and community development center, cooperates with 58 local primary and middle schools to bring ecological education into the classroom. Also, on the basis of the community agreements, local communities are encouraged to support the sustainable development of curriculum-based eco-tourism by providing multiple tourism services and carrying out forest ecosystem conservation through the cooperative. The Forest School has also been recognized by the Danba County Government and promoted nationwide as a county-level exemplary protection case.

(3) Innovation

Although the scale of sustainable tourism in the local area driven by Forest School is limited, it has presented a development model based on local communities. In this model, the Forest School continuously improves its product portfolio and operation management mechanism. The local community, rural tourism cooperatives and the school have reached close collaboration in a joint commitment to implement the conservation of the forest ecosystem so that all parties can achieve a win-win outcome.

Chinese and British students as well as local community co-creation project

Identification and specimen making of plants around the Forest School

As a social enterprise, the Forest School is committed to solving the problem in the balanced development of community ecology by commercial means, and has explored an ecological service-oriented economic path that can develop independently, solved the problem of the incompatibility of ecological environment conservation and economic development in protected areas and demonstrated the feasibility and actual value of developing ecological products in protected areas.

About the applicant: Denglong Yunhe Forest School (registered name: Danba County Denglong Yunhe Education Consulting Co., Ltd.) was established in 2015. In years of operation, it has kept exploring the way for nature-based innovative education and the sustainable development of the communities in the protected area, and gradually developed an ecological service-oriented economic model led by social innovation enterprises. Xinhua News Agency, xuexi.cn, ifeng.com, etc. have successively reported news about it.

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Dreamland Nature Center

Hangzhou Dreamland Nature Center

Approaches: Public participation; Publicity & advocacy

Target: Ecosystem diversity

Location: Hangzhou, Zhejiang, China

Year of Implementation: 2017

Background

The Dreamland Nature Center is jointly established by Hangzhou Botanical Garden, Alibaba Foundation, and Paradise International Foundation. The model of tripartite establishment integrated the power of the government, private enterprise, and social organization, putting in place a stable structure of one-party providing site, one party providing funds, and one party providing talent, and three parties interacting with each other. The Paradise International Foundation withdrew in August 2021, and the Dreamland Nature Center is currently mainly operated by the Alibaba Foundation.

The projects carried out by Dreamland Nature Center are mainly based in Hangzhou Botanical Garden which is located in Taoyuanling, West Lake District, Hangzhou, Zhejiang Province, with a total area of 284.64 hm^2. Founded in 1956, Hangzhou Botanical Garden is a comprehensive botanical garden featuring science, culture and a look of parks and focusing on scientific research. It is open to the public for the popularization of plant science and environmental science knowledge. Although it is located in the center of Hangzhou, with the advantage of being close to the West Lake and mountains, the biodiversity of Hangzhou Botanical Garden is rich with more than 3,000 species of plants, 150 species of birds, and equally diversified mammal species, including masked palm civets(*Paguma larvata*) , wild boars, Chinese muntjac, small-toothed ferret badger(*Melogale moschata*) , hedgehogs, Chinese hares(*Lepus sinensis*) , and red-bellied tree squirrels(*Callosciurus erythraeus*) .

Main activities

Since its establishment in 2017, the Dreamland Nature Center has carried out 3 major projects, namely Green Vest Public Welfare Initiative, Nature Carnival and Dreamland Class.

Green Vest Civilization Public Welfare Initiative in Hangzhou

①Through a series of activities such as campus lectures, nature education experience courses, nature notes and community nature games, the Green Vest Civilization Public Welfare Initiative provides offline nature education activities for young people in the city, strengthens the connection between young people and nature, alleviates the "nature deficit disorder" among children in the city, and helps the young establish the concept of respecting, complying with and protecting nature . In 2020, the Green Vest project won the gold award in the fifth Chinese Youth Volunteer Service Project Competition, which was co-sponsored by the Communist Youth League Central Committee, the Civilization Office of the Central Communist Party Committee, and the Ministry of Civil Affairs among seven ministries.

②Nature Carnival is a collection of nature experience activities for the general public held at the Hangzhou Botanical Garden every spring and fall. Its purpose is to draw the public to get closer with nature, to learn about nature, and to protect nature with various forms of activities. The Nature Carnival not only leaves a seed of nature in the children's experience but also provides practitioners in the field of nature education with more opportunities to engage with the public.

③Dreamland Class is a cross-disciplinary program, which, by basing the classes on concrete grass, trees, birds, and animals, is dedicated to inspiring imagination and creativity, and prompting the public to pay attention to the environment around them and think deeply about the relationship between human and nature.

Main outcomes

Social-economic value：

Green Vest Public Welfare Initiative has carried out Forest Tour, Citizen Science, Nature Ground Painting voluntary activities. Forest Tour served more than 30,000 people; Citizen Science served more than 4,000 people, which garnered over 2.5 million views online on Weibo and WeChat; Nature Ground Painting has directly served 680 people in 13 neighborhoods/communities.

Nature Carnival

Nature Carnival has been held for 7 consecutive editions from 2017 to 2020, attracted 204 organizations from all over the country, served over 80,000 people in total, and won a prize in the 8th Science and Technology Awards of Laing Xi, which is organized by the Chinese Society of Forestry.

Dreamland Class has now published the book titled *Nature Exploration in the Botanical Garden* with 30 selected lessons and the book titled *Nature Education at Your Side* with 60 selected lessons; training has been conducted for 3 consecutive years for 400 Green Vest volunteers, 152 teachers from Hangzhou Teacher Center, 14,436 rural teachers/principals who have won awards presented by the Jack Ma Foundation and 64 conservation site staff.

About the applicant: Hangzhou Dreamland Nature Center was established in 2017. Visions of Dreamland Nature Center: To become a nature paradise favored by the public, to create a high-quality space for natural education and to set a model of urban nature center.

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Wild Film Project

Corporate Citizenship in Action(Beijing)

Approaches: Public participation; Publicity & advocacy

Target: Species diversity

Location: China

Year of Implementation: 2012

Background

At the beginning of 2020 when the 20th anniversary of Ford China's Conservation and Environmental Grants China(CEGC) Awards approached, the Wildlife Conservation Short Video Competition Project("Wild Film Project") was launched in order to make the public realize the urgency and importance of wildlife conservation, to help the public correctly understand the value of wildlife and biodiversity, and to enhance the public advocacy capabilities of professional conservation organizations and expand the platform for their voices. In February, the organizing committee quickly communicated with nature conservation organizations and short video platforms. In March, the idea of bringing conservation organizations and activists on short video platforms to carry out education on biodiversity was determined. The project was established in April and launched in May, becoming the first public participation activity on the theme of wildlife conservation with professional environmental organizations as main participants, and become successful on the short video platform.

Second Prize of Best Guardian Image in "Wild Film Project"

Main activities

The "Wild Film Project" is co-organized by the CEGC Award Committee, Kuaishou, and Wild China, and co-sponsored by the Beijing SEE Foundation. It collected original short videos from both nature conservation organizations and the public. Kuaishou provided the two hashtag topics "Wildlife is Here" and "Wildlife Guardian" for professional environmental agencies to collect first-hand images and videos of wildlife and plants as well as stories of species conservation, hoping to comprehensively display the work and achievements of domestic grassroots conservation. "Fantastic Animals are Here" is taken as the hashtag topic towards the public to collect original short videos related to wildlife conservation.

The total number of short videos released under the hashtag topic "Fantastic Animals are Here" were more than 31,000, with 2.1 billion plays and over 20,000 participants in the topic. 105 professional environmental conservation organizations from all over China provided 902 short videos. 6 environmental organizations, including Cloud Mountain Conservation, won the "Best Species Video" award, and 6 professional organizations and individuals, including He Xin, an associate researcher from the Shanghai Natural History Museum, won the "Best Guardian Video" award and shared the "Wild Film Project" prize totaling RMB 400,000.

The "Wild File Project" also invited Chen Peng, a nature education expert, to track the trace of wild giant pandas through livestreaming, invited Xi Zhinong, the founder of Wild China, to livestream his visit to the Qingbi Creek, one of the 18 streams in Cang Mountain, and invited Qian Zhengyi, an expert from the Changjiang Conservation Foundation, to conduct livestreaming of the science of finless porpoise. These 3 livestreams attracted more than 768,000 viewers and received nearly 5,000 comments.

Online trainings were conducted with Kuaishou. Besides, 154 people have gained access to the support channels for Kuaishou's quality content, and the "Wild Film Project Partners Exchange Group" empowered by the Project continues to thrive until today.

Promotion page of "Wild File Project"

Main outcomes

(1) Ecological value

The "Wild Film Project" is the first public participation activity with the theme of wildlife and biodiversity conservation carried out on a short video platform in China, which provides the public a channel to correctly understand the value of wildlife and biodiversity. Dozens of rare wildlife species, such as Skywalker hoolock gibbon, grey-faced buzzard(*Butastur indicus*) , Hainan knobby newt(*Tylototriton hainanensis*) , marmot, Siberian ibex(*Capra sibirica*) , Snow leopards

and Siberian crane, as well as plants like tianma and dove tree appeared on the short video platform, vividly presenting the practices and achievements in China's ecological conservation.

(2) Social-economic value

The "Wild Film Project" invited hundreds of organizations to open short video accounts within a short period of time, and the short video communication compaign has effectively driven environmental organizations to embrace the mobile Internet era. 5 online training sessions in short video production and live streaming directly allowed nearly 90% of the participating institutions to open and know how to use short video accounts, and allowed about 10% of the participating institutions that had opened short video accounts to see a quick increase in followers. Many participating institutions experienced the sense of achievement as their short videos reached more than 100,000 view counts for the first time. The short video accounts became an important place for participating organizations to carry out public education and showcase their professional values.

(3) Innovation

①The "Wild Film Project" skillfully integrates empowerment, competition and long-term support. The short video uploaded by each organization with the highest view counts is included in the final competition results. The one-month collection and selection of the Project clearly recorded the growth trajectory of many organizations from a novice to an expert on Kuaishou. After five empowerment trainings sessions, 154 people received the support from Kuaishou's high-quality content channel, and Kuaishou has established a long-term learning network for professional environmental conservation organizations and short video platforms to realize a quick and interdisciplinary exchange.

②The innovative set-up of a professional segment and a public segment facilitated the cross-cutting environmental conservation, and invited some of the Kuaishou influencers to participate in the creation of short videos on the same topic, thereby expanding the influence of the activity while popularizing the value of wildlife conservation to a wider audience.

About the applicant: Corporate Citizenship in Action(Beijing) was established in 2008, and has become a bridge for cross-border exchanges and cooperation between enterprises and public welfare fields through the consulting of charity and public welfare path, public welfare project operation and voluntary service, serving many enterprises of Global 500, unicorn companies and well-known foundations. Entrusted by the organizer Ford Motor Company, Corporate Citizenship in Action(Beijing) has served as the China Organizing Committee of "CEGC Award" since 2012. In the past 10 years, it has actively advocated public participation in ecological conservation and tried to improve the influence of biodiversity conservation agenda through cross-border cooperation.

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Natural History Course Leading Teenagers to Enjoy Nature

Nature Guide

Approaches: Public participation; Publicity & advocacy; Traditional knowledge

Targets: Ecosystem diversity; Forest

Location: Beijing, China

Year of Implementation: 2009

Background

Beginning from 2009, based on their own research and practical experience and learning from the ideas, methods and contents of natural history, the teachers with long-term experience in guiding field activities at the Affiliated High School of Peking University and Beida Resources Middle School (now "Peking University Affiliated High School Laboratory School") have gradually formed an elective course with school characteristics—the Natural History elective course, which has brought new fun and experience to students in learning.

In 2014, the Nature Guide was established to promote the concept and form of natural history course for young people, and to gather social forces to support the further development of this course.

Main activities

The Natural History elective course works both as a classroom and a research subject, which opens the door to the knowledge for children to enjoy the fun of observing and studying nature. The teachers, based on the objective of the elective courses and the actual situation of students, prepare a number of topics, which can be chosen by students according to their own interests. In the whole learning process, the mode of speaking by teacher and listening by students has changed fundamentally.

For self-selected topics, children can refer to materials and think actively, which is completely

different from the passive learning common in acquiring book knowledge in the classroom. In this way, children can start to establish high standards for learning on their own.

A topic group often gathers students of different classes and grades. This new structure has formed a new relationship among students, and the most prominent change is that the competition for the rankings in classroom is transformed into the cooperative relationship of completing projects together, which improves students' teamwork skill.

The Nature Guide also employs professors, experts and professionals in protected areas as instructors. On the one hand, it increases students' knowledge, broadens their horizons, and more importantly, it makes students feel the rigorous working attitude and selfless dedication of scientific researchers. The children have forged a deep friendship with these teachers.

In the field practice base, the students who participated in the school year inspection had already completed the first batch of tasks of the day when the sun came out

The Natural History elective course has built innovative evaluation dimensions, methods and criteria. The learning is not evaluated by written examination, but by submitting a report after the project team completes the project, and making a report and reply at the plenary meeting.

The study, research and achievement display of the Natural History elective course are multi-dimensional: it is necessary to carry out demonstration before the class, the process of study and research shall be recorded, and the conclusion can only be recognized by combining the recorded data analysis and research. These are all necessary contents for the study evaluation of the Natural History elective course.

In this kind of evaluation method and evaluation system, every student gets his own space and platform, gets due recognition, and everyone is a success.

The instructor of Shaanxi Changqing Naitonal Nature Reserve instructed the students who participated in the school year inspection to observe the footprints of wild animals and make foot models of wild animals, which is one of the course contents of the students in the wild animal project team

The ultimate goal of the Natural History elective course is to influence students' emotions and attitudes as well as cultivate their values. Over the past decade, the changes in children have far exceeded the original intention of designing the course.

Student Deng Xueqiu talked about her understanding: “Natural history observation is not only for scientists, but also necessary for us to learn about the fauna and flora around us, thus adding a new dimension of life and we can live in a more vibrant way. I have understood the greatness of life. Even those lives that others seem extremely fragile or insignificant are stronger and greater than we can imagine.”

Main outcomes

(1) Social-economic value

After over ten years of research, practice and improvement, the educational project “Natural History elective course” has gradually formed a course system suitable for urban teenagers, leading them to walk into nature and love nature, and finally forming a sustainable development concept of nature. Over the past 10 years, over 2,000 students have gone through a 2-year course study, and more than 4,000 have participated in nature surveys carried out in national nature reserves. More than 10 front-line teachers in

different disciplines have been trained to engage in the research and implementation of Natural History courses. The course formed a long-term and stable benign interaction between school nature education and nature conservation in nature reserves. Long-term and stable interaction between the school's nature education work and nature conservation of the reserve is established.

(2) Innovation

Natural History elective course, where novel learning contents and learning methods are provided has built an innovative learning structure and learning relationships, and also introduced new evaluation dimensions, methods and criteria.

At the end of the school year inspection, students and instructors took a group photo in the reserve to record this wonderful time, which is also a cherished memory

About the applicant: The Nature Guide is a private non-enterprise unit registered with Beijing Municipal Civil Affairs Bureau. It is dedicated to guiding teenagers into nature, taking nature as a classroom, learning knowledge and skills in nature, cultivating their correct values and concept of nature, and laying the foundation for their more comprehensive and healthy development. The purpose of Natural Guide is : returning to nature and respect life.

CHAPTER V

Policy-making and Implementation

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Ecological Conservation Redline—Institutional Innovation of China's Biodiversity Conservation

Nanjing Institute of Environmental Sciences, Ministry of Ecology and Environment

Approaches: Policy-making and implementation

Target: Ecosystem diversity

Location: China

Year of Implementation: 2015

Background

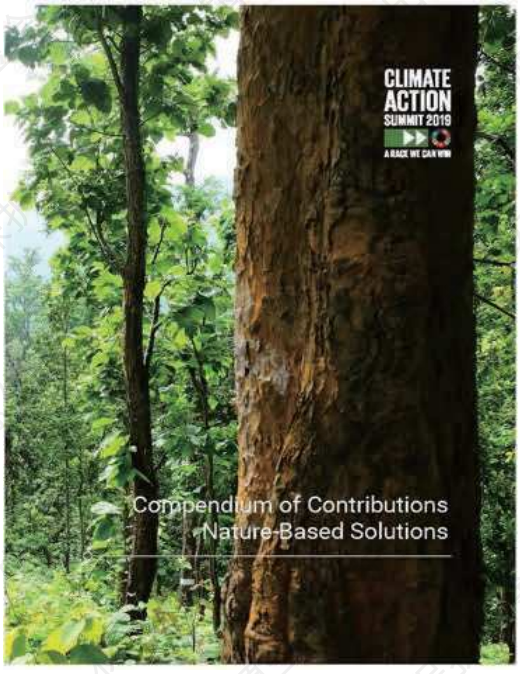
The establishment of a protected area (PA) system is recognized as a relatively effective way to slow down the rate of species extinction and biodiversity loss. In 2010, at the tenth Conference of the Parties to the CBD, scientists proposed that at least 17% of land and inland waters and at least 10% of coastal and marine areas should be protected.

As a comprehensive national policy framework, the existing PA system not only needs to consider technical solutions but also takes into account the feasibility of economy, finance, and management. An excessively high proportion of PA is facing the dilemma of implementation. Therefore, only the existing PA system is not enough to achieve the PA target proposed on a scientific basis. In this context, the technical team with Gao Jixi, a researcher from Nanjing Institute of Environmental Sciences, Ministry of Ecology and Environment, as the core put forward the concept of the Ecological Conservation Redline(ECR) and established a technical system with scientific research institutions, providing a brand-new ecological conservation model, that is, by controlling important ecological spaces to maximize ecological benefits gained from the ecological conservation area, and to maintain the integrity of the habitat and the national ecological security.

Main activities

ECR has innovatively expanded the scope of the PA. It is no longer limited to various traditional PA such as nature reserves. Instead, by taking into account the ecosystem services, ecological fragility, and biodiversity conservation hot spots in a comprehensive manner, it prioritizes the integrity and connectivity of the natural ecological system to achieve large-scale and integrated conservation of species and habitats and provide an innovative solution for global biodiversity conservation.

In 2015, the ECR was incorporated into the *Environmental Protection Law of the People's Republic of China* and *State Security Law of the People's Republic of China*. In January 2017, the Chinese government issued an opinion document on opinions of implementing the ECR and organized various provinces(autonomous regions and municipalities) to delineate the red lines of ecological conservation. In 2019, the *Guiding Opinions on Coordinating the Delimitation and Implementation of Three Control Lines in National Spatial Planning* was issued to introduce a red line control system for ecological conservation. At present, China has completed the delineation of the red line of ecological protection, and about 30% of the land area is included in the range delineated by the red line.



ready to scale-up the capacity of forests as the contribute to capturing between 10 and 12 gigatons of atmospheric carbon dioxide each year.

3. The contribution of Central African forests to the global fight against climate change, led by Gabon is convening with CAFI (Central African Forest Initiative), a partnership which also includes Cameroon, Central African Republic, Republic of Congo, the Democratic Republic of Congo, and Equatorial Guinea.

4. Ecological Conservation Redline (ECR) is a practice developed by the People's Republic of China to protect biodiversity and advance climate action through the development of green corridors: it is being enhanced with the support of the UN Sustainable Development Solutions Network and in partnership with the Convention on Biological Diversity (CBD) with a particular focus on the 15th CBD Convention of the Parties (oCOP) in Kunming, China in October 2020.

5. The Sustainable Growth, Livelihoods and Ecosystem Restoration Initiative, known as the Billion Trees Tsunami, is being implemented in Pakistan: it is a major effort to restore ecosystems and support reforestation.

ii) Enhancing regional and international cooperation for NBS

6. BRI International Green Development Coalition (BRIGC) is led by China: it involves 25 other countries and more than 100 other partners: it is an open, inclusive and voluntary international network which aims to incorporate green development into the Belt and Road Initiative, promote international consensus and collective actions on the development of Green Belt and Road and implement the 2030 Sustainable Development Goals. BRIGC will provide platforms for policy dialogue and communication, knowledge and information, green technology exchange and transfer.

ECR was selected into the NBS initiative case compilation of the United Nations Climate Action Summit

The ECR has an important impact on the international community. At the United Nations Climate Action Summit in September 2019, the ECR was selected as one of the 16 best initiatives boosting climate ambitions and accelerating actions.

Main outcomes

(1) Ecological value

The ECR in China covers 4 major types of key ecological function areas, 51 nature reserve groups in 9 major sub-regions, and 23 ecologically fragile areas of 3 types. It protects the most valuable "clear water and lush mountains" and "high-quality ecological products" and the important national ecological security barriers, covering more than 95% of species under key state protection, more than 90% of excellent ecosystems and natural landscapes, and playing an important role in purifying the atmosphere, expanding the capacity of the water environment, and providing ecological products.

According to the internationally accepted method of ecosystem service valuation, the value of ecosystem services that can be generated by the ECR is RMB 27.95 trillion each year, and the value per unit area is 1.4 times the national average. The ECR offers comprehensive conservation of biological species and habitats, provides a strong guarantee for maintaining national ecological security and promoting sustainable economic and social development, and is regarded as "another lifeline after the Farmland Redline".

(2) Social-economic value

The concept of ECR has been widely recognized by the whole society. President Xi Jinping has delivered important speeches on the ECR for more than 20 times. Over 30 national ecological civilization reform policy documents involve the ECR. "Ecological Conservation Redline" has more than 28 million entries in the online search engine and was reported by the news media many times. The ECR has been included in the national cadre learning and training materials, and in 2019, it was selected to be included in the large-scale achievement exhibition for the 70th anniversary of the founding of the People's Republic of China.

On the global stage, China has introduced the experience of the ECR to the Association of Southeast Asian Nations and the Shanghai Cooperation Organization, and has developed an ECR delineation toolkit jointly with IUCN. The Green Belt and Road Initiative promoted by China Council for International Cooperation on Environment and Development will promote the concept and practical experience of the ECR to the countries along the route.

(3) Innovation

①The transformation from pure species resource conservation to comprehensive management and control of ecological space. It not only pays attention to biodiversity hotspots but also protects important ecological function areas and ecologically fragile areas from the perspective of maintaining ecosystem services and ensuring the safety of human settlements.

②Coordinating ecological conservation and economic development, and emphasizing scientific planning. The delineation of the ECR aims to build a national ecological security pattern, comprehensively considers the needs of ecological conservation and the planning of economic and social development, and realizes overall analysis, regional overall planning, and top-level design.

③Putting in place effective guarantees and controls through the government's leadership. In terms of planning, appropriate administrative means can be used to guarantee the planning objectives; in terms of operation, there are sufficient resources and strong policies to ensure the maintenance of designated areas; in terms of management, rigid control is used to prevent and stop human developing activities from influencing the designated area.

About the applicant: The Nanjing Institute of Environmental Sciences, Ministry of Ecology and Environment(hereinafter "Nanjing Institute") , established in 1978, is a public welfare scientific research institution directly under the Ministry of Ecology and Environment of the People's Republic of China. It focuses on ecological conservation and rural environment, and devotes itself to the research of forward-looking, strategic, basic and application environmental issues. It has built three ministerial-level key laboratories equipped with more than 1,000 sets(suits) of domestic first-class instruments and equipment. The Nanjing Institute has completed more than 1,000 large and medium-sized projects, and has cooperated and exchanged with more than 10 international organizations(such as UNEP and IUCN) and more than 30 countries, and won more than 60 national, provincial and ministerial scientific and technological progress awards.

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The Saving Our Species Program

New South Wales Department of Planning, Industry and Environment

Approaches: In-situ conservation; Legal approach; Public participation; Publicity & advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity; Access and benefit- sharing of genetic resources; Traditional knowledge

Targets: Forest; Farmland; Flora; Mammals; Freshwater creatures; Germplasm resource conservation

Location: New South Wales, Australia

Year of Implementation: 2013

Background

Australia is home to 7%~10% of the world's biodiversity; 85% of land mammals and 91% of flowering plants are found nowhere else. New South Wales (NSW) is Australia's most populous state and home to some of Australia's most diverse environments, from deserts to snowy mountains and sub-tropical rainforests. Sadly, colonisation left Australia with one of the world's highest extinction rates for animals and over 1,000 threatened species. Between the years 1996 to 2016, the number of threatened species listed in the Australian state of NSW increased by 51%. Biodiversity here faces many challenges—there are almost as many species and communities listed as threatened in the state of NSW(1,047) as there are for Australia as a whole(1,681) .

The New South Wales Government needed to respond to this crisis before it was too late. They created Saving our Species in 2013 with an investment of $100 million later in 2016, a world class program that brings volunteers, scientists, business and conservation groups together to secure the future of Australia's unique plants and animals.

Main activities

Saving our Species is a framework for a new approach to conservation that works to ensure the security of as many species and ecological communities as possible. The project aims to increase the

number of threatened species that are secure in the wild in NSW for the next 100 years, and control key threats facing threatened plants and animals.

The first step in the framework is to review every listed species, ecological community, and endangered population in NSW. This information is stored in the program's custom database, where active projects report on resourcing and outcomes, providing a single point of truth across the state.

For every species where targeted sites can be identified, the program prioritises on-ground action based on cost effectiveness. This is the Project Prioritisation Protocol, implemented with custom-built software that allows each species' project to be compared on benefit, feasibility, and cost. Each species, not only the charismatic species, has a chance to be considered, and resourcing goes where evidence suggests there will be the greatest return on the investment.

The program invests in funding ground-breaking and world leading research that improves decision-making and data collection where it matters most. For landscape-scale species, the team includes spatial scientists to develop models depicting how these species use the landscape and which patches of habitat will be connected and healthy in the future. To help make difficult decisions, the team includes decision scientists，figured out how to measure the value of information, used to evaluate whether collecting more data could improve management outcomes, and even incorporate Artificial Intelligence(AI) to support high-stakes decision making in an environment with limited information.

Mountain pygmy possum(*Burramys parvus*) (Alex Pike/Photographer)

Releasing a Bellinger river snapping turtle (*Myuchelys georgesi*) (Brent Mail/Photographer)

All aspects of the Saving our Species Framework have broad scope for further application. The large-scale, multi-species data the program has collected through the database is in high demand from conservation researchers globally; there have been 113 scientific papers related to different aspects of the program. By providing data collected through robust, large-scale coordination and a central database, Saving our Species has contributed to six National Environmental Science Program(NESP) Threatened Species Hub projects. These include assessing monitoring accuracy across Australia and making major contributions toward the Threatened Species Index. These data also provide the basis for estimating the cost of threatened species recovery across the continent in NESP 7.7, "A knowledge synthesis to inform a national approach to fighting extinction".

Main outcomes

(1) Ecological value

Saving our Species is actively advancing the United Nation's SDG 15 – Life on Land. Since 2016, Saving our Species has increased the number of threatened species and communities under active management from 94 to 424 – a 350% increase. In 2019—2020, this amounted to ~40% of 1,047 listed entities. The program developed 978 conservation strategies in just 5 years.

Ecological change takes place on long timescales, and most natural systems—including threatened species—need to be monitored for decades to see changes. Nonetheless, project is already producing results, with 51% of species with on-ground action either stable or increasing.

(2) Social-economic value

①Saving our Species' ground-breaking approach to conservation has already drawn interest from

other states and territories, including Queensland and the ACT, both of which have expressed interest in developing prioritisation approaches for their jurisdictions. Saving our Species was the subject of a recent paper published by researchers based in Canada, where the program's cost-effective approach compared favourably to programs in New Zealand and even the USA, despite the latter's larger overall budget. This demonstrates how Saving our Species' approach has the potential to shift Australian and global conservation research and practice towards strategic prioritisation and comprehensive focus.

Wee jasper grevillea(*Grevillea iaspicula*) seeds (Alex Pike/Photographer)

②Saving our Species has over 225 partners who help deliver on-ground actions, contribute resources and expertise, and undertake joint-research. Through partnership, the program can deliver more projects, achieve greater outcomes, raise people's conservation awareness, and multiply investment.

(3) Innovation

Technological innovation has elevated Saving our Species from a small, targeted program to a comprehensive, strategic, innovative framework for large-scale conservation. Innovations include: ① Saving our Species database; ②Project Prioritisation Protocol custom software; ③Spatial modelling of Population persistence; ④AI for image analysis and decision science.

About the applicant: The NSW Department of Planning, Industry and Environment(DPIE) , which brings together specialists in urban and regional planning, natural resources, industry, environment, heritage, Aboriginal and social housing, in the state of New South Wales, Australia. DPIE serves the people of NSW by developing well-connected communities, preserving our environment, supporting our industries, and contributing to a strong economy. DPIE is working on long-term planning, planning assessments, infrastructure priorities, natural resources, the environment, energy and growing the State's industries.

Exploration and Practice on the Reform of Collective Land Easement in Qianjiangyuan National Park

Qianjiangyuan National Park Administration

Approaches: In-situ conservation; Legal approach; Public participation; Policy-making & implementation; Sustainable use of biodiversity; Access and benefit-sharing of genetic resources

Targets: Forest; Farmland; Plants; Mammals; Amphibians; Avifauna; Freshwater creatures; Germplasm resource conservation

Location: Qianjiangyuan National Park

Year of Implementation: 2018

Background

The Qianjiangyuan National Park System Pilot Area is currently the only national park system pilot area in the "Yangtze River Delta" in China, with a total area of about 252 km^2, of which collective land accounts for as much as 80.3%. In view of the high proportion of collective land, with the guidance and help of a group of experts and scholars including Researcher Su Yang from the Development Research Center of the State Council of the People's Republic of China, the Qianjiangyuan National Park Administration took the lead in launching the collective land easement reform in 2018.

Farmland easement reform base on high mountains

Main activities

While not changing the land ownership, through the establishment of a scientific and reasonable easement reform compensation mechanism and a community-based co-management mechanism, the unified management of important natural resources within the scope of the national park has been realized.

(1) Reform of collective woodland easement

①Authentic right determination. Checking the boundaries of the collective woodland within the scope, the mountain forest ownership certificates, and the mountain forest inventory and the management circulation to fully learn about the details. ② Inclusive decision-making. Three resolutions were adopted to set the content of the resolutions on the use and management of compensation and the land easement reform. Another two related contracts made the residents, the village committee, and the Administration form a two-tiered agency relationship. ③Contract signing. The village committee signs an easement contract with the Administration, clarifying the basic conditions of the servient tenement, the amount of compensation, the contract period, and the rights and obligations of both parties. The Administration gives easement compensation of RMB 48.2 per mu per year to the village committee under the premise of the village committee fulfilling obligations such as not damaging the environment of the national park. ④Registration and certification. The Bureau of Natural Resources and Planning of Kaihua County issued a Woodland Easement Certificate for Qianjiangyuan National Park, which was associated with the Woodland Ownership Certificate.

(2) Reform of the easement of rural contracted land

①Well defined scope. Based on the boundary and functional zoning of Qianjiangyuan National Park, Dongtou Village, Jiangwan Township, Wuyuan County, Jiangxi Province shall be included in the scope of the rural contracted land easement reform. ②Self-application. The production entity applies to participate in the reform of the scope of farmland, and reports to the Administration for review and confirmation. ③ Contract signing. The production entity signs an easement reform contract for rural contracted land with the Administration, clarifying the basic conditions of the servient tenement, the amount of compensation, the contract period, and the rights and obligations of both parties. Under the condition that the production entity fulfils the obligations including not using chemical fertilizers,

"Wood to Gas" pilot project initiated by the Qianjiangyuan National Park Administration in Longkeng Village, Hetian District on September 4th, 2020

pesticides and herbicide, the Administration shall give RMB 200 per mu per year as easement compensation.

(3) Supporting reforms related to easements

While carrying out the reform of collective land easement, the Qianjiangyuan National Park Administration issued a series of supporting policies and measures, such as the Wildlife Rescue Reporting and Incentive Measures, Dangerous Wild Animals Public Liability Insurance, Wood to Gas(Electricity) Pilot Project, Measures for the Management of Ecological Conservators, and Franchise Management Measures', effectively protecting the rights and interests of owners of servient tenement.

Main outcomes

(1) Ecological value

Through collective land easement reforms and related supporting reforms, Qianjiangyuan National Park has realized an important transition from "being asked to protect" to "voluntarily protect", forming a pattern of "National Park is a community with shared future". While realizing the unified management of important natural resources within the scope of the national park, the strict protection, overall protection, and systematic protection of the natural ecosystem have been implemented from the source, ensuring the long-term stability of the national park from the mechanism.

Qianjiangyuan National Park of Zhejiang Province where the mid-subtropical evergreen broad-leaved forest with representative varieties *Castanopsis eyrei* and *Schima superba* is full of vitality in spring

(2) Social-economic value

Qianjiangyuan National Park's innovative implementation of collective land easement reform has aroused strong responses in China. Professor Qin Tianbao from the Law School of Wuhan University made a systematic elaboration of the easement reform. He believes that, compared with the compulsory and confrontational expropriation system and the consensual traditional land transfer model, the easement conforms to the theoretical structure and has been verified in practical exploration, providing new ideas for realizing the dominant status of state-owned land in national parks. Zhou Shaozhou, Deputy Director of the National Park Office, believes that the registration of the easement conservation will be a major breakthrough and contribution, which will provide practical experience for the next legislation. Professor Lu Zhi from Peking University believes that the reform of farmland easement is a prime case of farmland biodiversity conservation. Dr. Peng Kui from the Global Environmental Institute believes that Zhejiang Province is not only the first to do it but also issues certificates and confirms rights, from which the spirit of daring to reform can be seen.

(3) Innovation

The collective land easement reform of Qianjiangyuan National Park is a consensus reached through negotiation, which avoids fierce conflicts between the engaging parties and can take into consideration of the reasonable demands of the owners of servient tenement. This reform does not presuppose the possession of the servient tenement, and the signing of the contract does not change the ownership of the collective land, but only imposes certain restrictions on the right holders of the servient tenement, and the easement only restricts part of the right to use. The right to use it as a usufructuary right and the right to benefit will not be lost. The two parties can independently agree on the purpose, method, and compensation of the use, and reach an agreement through negotiation. The farmers can still engage in unrestricted matters on the land. Thus, the secondary use of land is realized to obtain residual income.

About the applicant: In April 2019, the Editorial Board of Zhejiang Provincial Party Committee integrated the original Party Working Committee and Management Committee of Qianjiangyuan National Park, and established Qianjiangyuan National Park Administration, an administrative organization at the department level and a provincial-level budget unit, which was vertically managed by the provincial government and hosted by the Zhejiang Provincial Forestry Bureau. The Administration has an office(under the Natural Resources and Planning Department) and the Community Development and Construction Department, under which a comprehensive administrative law enforcement team of Qianjiangyuan National Park is set up.

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Acceleration Program for Local Protected Areas — Municipal Environmental Protection Area/APA Capivari-monos

Local Governments for Sustainability – South America

Approaches: In-situ conservation; Policy making and implementation; Sustainable use of biodiversity

Targets: Forest; Urban

Location: Brazil

Year of Implementation: 2020

Background

Acceleration Program for Local Protected Areas—The program aims to bring innovation to the public sector in order to foster long-term positive impacts on the management of local protected areas. The municipal Environmental Protection Area Capivari-Monos in Sao Paulo city faces great difficulty in management due to the size of the area, occupation characteristics and activities allowed. APA Capivari-Monos was chosen as the pilot case for the Acceleration Program, as it is the first municipal protected area in Sao Paulo city, and the only APA that had an approved Management Plan.

Main activities

In partnership with recognized institutions, Local Governments for Sustainability (ICLEI)- South America created a solid methodology to accelerate the construction of municipal protected areas in Brazil. The methodology includes a roadmap of one year, focusing on Strategic Planning and Implementation; Governance and Institutional Arrangement; Partnerships and Collaboration Networks; Territorial Economic Potential Development; Sources of Financial Resources for the Protected Area Management; Communication and Engagement.

The Initiation Stage was marked by an alignment between ICLEI and Sense-Lab(the consultancy hired to develop and implement the program, specialized in strategy and innovation with a focus on

developing the organizations, systems and leadership necessary to face the main collective challenges). Part of this stage also included the first contact with the management team of APA Capivari-Monos and the Municipal Secretary of Green and Environment of Sao Paulo.

The Understanding Stage involved analyzing documents about local protected areas and Other Effective Area-based Conservation Measures(OECMs) in Brazil, as well as interviews with key stakeholders. The main investigation goal was to understand the main challenges, axis, and mechanisms for the managing and financing of conservation units.

In the Interpretation Stage, the macro structure of the program was drawn. Impressions and reflections were collected to delimit the methodology bases.

In the Development Stage the Acceleration Program's flow was developed. It involved assessing offerings, stages, activities, contents, and people that should be involved as mentors or specialists.

The Acceleration Methodology was defined as being completely online (due to the COVID-19 pandemic) combining virtual workshops, exchanges with mentors, and internal activities.

The Piloting Stage began in September 2020. The APA Capivari-monos managers and public servants from the Municipal Secretary of Green and Environment of Sao Paulo joined the whole process. Other key territorial stakeholders were also integrated as observers which included local entrepreneurs, SESC(Social Service of Commerce) , non-profit private institution.

Capivari-Monos APA （Luccas Longo/Photographer）

An Emblematic Waterfall of the Capivari-Monos APA （Joca Duarte/Photographer）

After analyzing the territorial potential, the themes of agriculture and tourism were chosen as areas of highest priority, both for the management of the protected area and for the local community. There were also parallel activities, in which the participants built one Theory of Change model for each theme. This served as a strategic implementation plan that supplied both the context and problem, the public or impact focus, interventions, outputs, and the short to long term results possible in the next 5 years, as well as an impact vision.

In 2021, the program was implemented with 6 other municipal protected areas in Brazil. By using the ICLEI networks' structures, actions implemented during the project had the potential to be replicated in different South American countries.

Main outcomes

(1) Ecological value

PA are one of the most important tools to protect biodiversity in-situ. The importance of Local

Protected Areas includes the provision of essential ecosystem services, ecological connection, enhancement of ecosystems' adaptation capacities and reduction of climate change vulnerability. The Acceleration Program aims to strengthen the management of municipal PAs and expand their biodiversity conservation capacities and to promote more sustainable agriculture practices compatible with biodiversity conservation.

South American tapir (Tapirus terrestris), the largest terrestrial mammal in Brazil(Daniel Zupanc/Phorographer)

(2) Social-economic value

The Acceleration Program stimulates the territory's socioeconomic development potential. It also stimulates the local circular economy, employment opportunities, social inclusion and income distribution, improving living conditions and driving vulnerable communities to an economic recovery in a post pandemic context. In addition, the working groups also help the structuring of municipal government public policies not only inside the APA Capivari-Monos territory but in a part of the rural area of the south of Sao Paulo city.

(3) Innovation

This program is a case of methodology and experience that propose to bring good practices from the corporate world and innovation to public management, especially the management of protected areas and biodiversity.

About the applicant: The Local Governments for Sustainability (ICLEI) is a global network of over 2,500 local and regional governments committed to sustainable urban development. Active in over 125 countries, they influence sustainability policies and drive local action for low-carbon, nature-based, equitable, resilient and circular development. Their network and team of experts work together providing access to knowledge, partnerships and capacity building to generate systemic change for urban sustainability.

CHAPTER VI

Financial Support Mechanisms

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Qiandao Lake Water Fund—Exploration on Ecological Sustainable Development of Qiandao Lake Basin

Hangzhou Qiandao Lake Huku Agricultural Technology Co., Ltd.

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity

Targets: Freshwater and wetland; Farmland; Plants; Avifauna; Freshwater creatures

Location: Qiandao Lake, Zhejiang Province, China

Year of Implementation: 2018

Background

In China, non-point source pollution has replaced point source pollution to be the main problem of water pollution. It is not easy to control the non-point source pollution caused by unreasonable land use and agricultural production in the source catchment area, and it needs exploration of effective measures with support of sustainable funding to tackle this problem.

Main activities

The Qiandao Lake Water Fund (hereinafter, the Water Fund) was launched in Feburary 2018. Working closely with the government and social capital, it took the lead in exploring the application of NbS in water source protection in Qiandao Lake, an important drinking water source in the Yangtze River Delta. It has protected and developed more than 1,000 mu of rice fields and tea plantations along the Qiandao Lake basin. It has reduced agricultural pollution by using reasonable incentive mechanisms and developed the market-oriented mode where beneficiary makes payment within the Qiandao Lake basin. It takes advantage of its location to drive the transformation and upgrading of industries such as local culture and creation, ecological tourism and vacation, and nature education.

①Starting with scientific analysis, it identifies the most critical polluted regions and tests the best agricultural measures and standards, and has also built an intelligent agricultural water-protection

platform to encourage farmers. It promoted ecological measures to the whole basin of Qiandao Lake in Zhejiang Province and even to Mount Huangshan of Anhui Province in the upper reaches, providing quantitative indicators for ecological compensation, ecological improvement, and embodiment of ecological value. The implementation of the "Double reduction of fertilizer and pesticide" policy on the demonstration site of Qiandao Lake makes the rate of nitrogen and phosphorus loss in the demonstration field reduced by up to one-third without any reduction in yield, laying foundations for the large-scale promotion of technology.

Ecological island next to the ecological ditch with purified agricultural water drained to the ditch

②In terms of ecological protection, Qiandao Lake Water Fund promotes NbS, biological prevention and control measures, to creatively protect and further enrich the biodiversity of the agricultural ecosystem in four demonstration sites.

③The mode of the Water Fund integrates multiple resources to provide unprecedented financial and management mechanisms for large-scale protection actions, and the long-acting self-operation is achieved by self-iteration. This model can not only attract water users to invest in the protection of water catchment areas, but also combine pollution and water control with the agriculture and forestry industries. In the short term, it can improve the quality of water sources, and bring profound environmental benefits in terms of public health, biodiversity, and climate change adaptation; while in the long term, the financial mechanism can yield better and consistent outcomes of protection, which helps shift the focus to water source environmental protection in the new rural constructions and enable communities to benefit from the protection. At the same time, it has developed the beneficiary-payment mode in places with water sources and has formed the long-acting operation mode.

Main outcomes

(1) Ecological value

Since Qiandao Lake Water Fund began operation in 2018, it has implemented NbS and governance mechanism of "source reduction-process interception-terminal treatment".

In order to improve the resilience of the farmland ecosystem, the Water Fund has also cooperated with Zhejiang A&FUniversity to transform hard ditches and developed "Ecological Ditches" and a rice-fish system, which has innovatively restored the local cycle of the food chain. Green manures such as the Chinese milkvetch(*Astragalus sinicus*) are planted to replace some chemical fertilizers. Trap

crops such as the vetiver(*Chrysopogon zizanioides*) , as well as nectar plants such as the *Cosmos bipinnata*, *Zinnia elegans*, *C. sulphureus*, can not only inhibit the growth of weeds but also reduce the incidence of rice diseases and insect pests. In low-lying fields, the Water Fund has established a natural filtering mechanism of "Ecological Island", which can not only reduce soil and water loss but also make up for the loss of economic benefits with a variety of water-purifying plants.

(2) Social-economic value

①Cooperation with platforms. The Water Fund attracted social investments from enterprises to establish the demonstration project for the restoration of water sources. Through cooperation with Zhejiang Agriculture and Forestry University, it introduced major provincial science and technology projects to Zhejiang Province, which has directly attracted public investments of 4.02 million yuan in the protection of water sources for Qiandao Lake.

②Brand building of "Ecological Protection of Water" Based on the protection of water sources, the Water Fund integrates various resources to create the brand image of "Ecological Protection of Water" through the cooperation with Hangzhou Government, Chun'an County Government and Culture, Radio, Television, Tourism, and Sports Bureau of Chun'an County, and invites people in public welfare for environmental protection from all over the world to join the water source protection of Qiandao Lake. Through public welfare cooperation with Qiandao Lake Marathon, on the one hand, the commercial profit of Marathon could be used for the protection of water sources, on the other hand, it guided Qiandao Lake Marathon to carry out water source protection activities. The series of activities attracted nearly 6 million participants and received widespread media coverage.

Demonstration rice field: rice-fish system

③Publicity and education. Training for teachers in the upper and lower reaches of water sources has been carried out, and the E-STEAM (Environmental sciences, Science, Technology, Engineering, Art and Math) education courses on water source protection have been introduced into schools. Natural education courses are also provided, which has promoted the business of catering and agricultural products in surrounding communities, with total sales of more than RMB 500,000.

(3) Innovation

①This project has introduced an internationally recognized innovative mode—treatment of non-point source pollution, and makes further innovations based on the actual situation, introduces extensive social forces to participate in the protection of water sources, and uses the market mechanism to motivate farmers

to join the water conservation, so as to achieve win-win results of watershed protection and rural revitalization.

②This project has embraced the Internet Plus era and built a platform for smart agriculture. Through cooperation with Ant Financial, it has developed a mini-program named "Treasure for Water Conservation", which applied blockchain technology to water source protection, and guided residents from Qiandao Lake to participate in the protection of the ecological environment.

Nectar plants planted in the water source protection demonstration site of Qiandao Lake Water Fund attract butterflies

About the applicant: The Qiandao Lake Water Fund is the first project of China Water Source Protection Charity Trust getting off the ground, which is jointly sponsored by Alibaba Foundation and Minsheng Tonghui Public Welfare Foundation. Hangzhou Qiandao Huku Agricultural Technology Co., Ltd. is the commercial entity of the project. The project is a part of the innovation content of the Qiandao Lake project with USD 150 million of the loan provided by the World Bank and is the largest water fund in China at present. With the "public welfare mentality and commercial methods", it dedicates to realize the long-term protection of water sources, improve farmers' production methods and environmental awareness, and help cultivate and develop the eco-industrial chain.

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Nature-based Solutions to Combat Climate Change

Procter & Gamble(China)

Approaches: In-situ conservation; Financial support mechanisms

Targets: Ecosystem diversity; Species diversity

Location: Philippines, Brazil, China

Year of Implementation: 2020

Background

In response to the global goals set out in the *Paris Agreement* and the "double carbon" goals (carbon peaking and carbon neutrality) set by the Chinese government, Procter & Gamble(P&G) announced a new commitment in 2020 to promote the company's global operations to achieve carbon neutrality in the next decade.

Nature itself can mitigate up to one-third of the impacts of climate change. Although protecting, improving and restoring important ecosystems such as forests, wetlands, grasslands and peatlands can offset more carbon emissions, the remaining two-thirds of carbon emission reduction needs technological solutions, which can bring greater synergistic benefits in terms of environment and social economy.

Main activities

P&G is formulating a detailed project funding plan to provide support for related projects around the world.

①Work with the Conservation International(CI) to carry out the Palawan Conservation Project in the Philippines—to protect, improve and restore Palawan mangroves and major ecosystems. Palawan is the fourth largest "irreplaceable" area in the world, with many rare and endangered wild animals.

②Work with WWF to advance the Atlantic Forest Ecological Restoration Plan— to restore the Atlantic forest landscape on the east coast of Brazil, and produce a significant positive impact on

biodiversity, water resources and other collaborative fields including food security.

③Join forces with the Arbor Day Foundation to establish an evergreen tree alliance—to unite the forces of enterprises, communities and citizens to protect the daily necessities affected by climate change through effective measures.

④Through cooperation with China Environmental Protection Foundation, the P&G China Pioneer Program was initiated in 2015. The project supports the development of college student associations, promotes the improvement of their professional abilities, and cultivates future leaders for China's environmental protection cause via "learning in action". The project has provided project activity funds and capacity building support for 144 associations in 125 universities across 11 provinces, cities and regions, with 8,078 college students directly participating in the project activities, and 100,000 students benefiting from the learning and exchange network. From 2020 to 2021, the P&G China Pioneer Program has taken "Youth and Nature-based Solutions" as the theme, and conducted extensive research. On August 25th, 2021, the first NbS survey report was published at the "National Low Carbon Day" event organized by the Ministry of Ecology and Environment.

Mangroves

⑤P&G's brands are also accelerating the pace in contributing to biodiversity. A natural hair care brand of P&G has joined forces with Royal Botanic Gardens, Kew and Kunming Institute of Botany(KIB) of China Academy of Sciences(CAS) to support the "Millennium Seed Bank" project of Kew Gardens and help scientists research and protect 20 species of endangered plants in China.

Main outcomes

(1) Ecological value

P&G works with local communities, residents and local governments to ensure that projects are developed in the right way: strengthen the protection of existing virgin forests; pay attention to critical ecosystems. These key areas are the habitats of a large number of animals and plants, and also the key areas for carbon reduction. Forests are often the source of livelihoods for local residents, so while achieving carbon reduction, it is also a must to protect biodiversity and produce a positive impact on local communities.

Field investigation by college students

(2) Social-economic value

Nature protection is not only taking appropriate response measures, but also cultivating new environmental protection forces for the future. P&G China's professional advantages in leadership shaping, research capabilities and brand marketing are widely recognized by society, and its environmental protection practices in product design and factory operations are worth sharing. The company has advantages in cultivating future environmental protection leaders and can effectively cultivate environmental protection professionals.

About the applicant: Procter & Gamble (P&G), founded in 1837, is one of the largest consumer goods companies in the world. In 1988, P&G entered the Chinese market, and its tenet of "being close to life and beautifying life for present and future generations" is reflected not only in its brand products and services, but also in its civic responsibility. P&G has been actively sharing the concept and practice of global corporate social responsibility, and through persistent efforts in the fields of community public welfare, environmental protection and disaster relief, actively practicing its responsibility as a Chinese corporate citizen, and becoming a positive force in Chinese society.

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"Yixin Huatai One Yangtze River" Ecological Conservation Project

Huatai Securities Co., Ltd.

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making & implementation; Financial support mechanisms; Sustainable use of biodiversity

Targets: Forest; Grassland; Ocean and coastal; Urban; Freshwater and wetland; Mountain

Location: Yangtze River basin, China

Year of Implementation: 2018

Background

A good ecological environment is the fairest public good, and protecting the ecological environment is a natural social responsibility of financial enterprises. In response to the "Yangtze River Comprehensive Protection" strategy, Huatai Securities Co., Ltd.(hereinafter Huatai Securities) has established the "Yixin Huatai One Yangtze River" charitable ecological conservation project to gather multiple social forces, promote the mainstreaming of biodiversity conservation in the Yangtze River basin, and incubate innovative solutions for the harmonious coexistence of man and nature.

Main activities

(1) Conserving the biodiversity of the Yangtze River basin

Huatai Securities has reached strategic cooperation with Shan Shui Conservation Center(Shan Shui) to carry out species monitoring and community-based conservation with herders as the main body in the source region of the Yangtze River. Till now, four community-based nature reserves have been established, covering 2,000 km^2. High-quality nature experience products have been created to allow herders to benefit from conservation. In the Yangtze River Delta, Huatai Securities, together with Shan Shui and the Fudan University, invited the public to participate in information collection and data analysis of urban wildlife distribution and to improve the urban wildlife management system.

In 2018, Huatai Securities initiated the "Yixin Huatai One Yangtze River" charitable ecological conservation project, and joined forces with Shan Shui, WWF and other social organizations to conserve biodiversity in the Yangtze River basin and promote sustainable development

Huatai Securities has initiated the "Wildlife Conservation Micro-Fund" with WWF and the OPF to support the in-situ conservation of rare and endangered species in the Yangtze River basin, and provide financial and intellectual support to local organizations.

The project provides long-term support for Green River Environmental Conservation Association of Sichuan Province (hereinafter,Green River) to carry out waste recycling, environmental protection publicity, and university student volunteer activities in the source region of the Yangtze River.

(2) Promoting citizen science and strengthening the publicity of public welfare

Citizen Science Actions were carried out, covering central cities in the Yangtze River basin such as Shanghai, Nanjing, Suzhou, Wuhan, and Chengdu, and first-tier cities such as Beijing and Shenzhen to educate the public to become the leading force for species monitoring and research. In addition, Huatai Securities have also carried out "Four Seasons in Peking University Campus""Four Seasons in Beijing" and other nature watch projects, and supported public activities such as "Plant Guardians" and "Shenzhen City Nature Challenge", with more than 10,000 direct participants.

The way of conducting public welfare publicity is innovative. In 2020, together with the SEE Foundation, the "One Yangtze River" Carnival was held, with nearly 400,000 people participating online and offline. In 2021, Huatai Securities joined forces with the Beijing Representative Office of the ICF to launch the "One Yangtze River, Thousand Cranes" on Douyin and Weibo to promote

scientific knowledge of crane conservation, and organized a cross-industry art tour exhibition, with more than 860,000 people participating online and offline.

(3) Taking environment, society and governance(ESG) as a link to promote dialogue between capital market and ecological protection

In December 2020, under the guidance of the Executive Committee Office for COP15, Huatai Securities sponsored the "One Yangtze River" Sustainable Development Forum with China Environmental Protection Foundation and Shan Shui to explore the ecological environment access in ESG investment, roll out biodiversity impact assessment tools, and assist Shan Shui in establishing communication mechanisms with ESG rating agencies and asset management agencies.

(4) Exploring poverty alleviation by ecological methods

In 2020, Huatai United Securities, one of the subsidiaries, offered financial aid to the Amity Foundation and Shan Shui to carry out franchise projects in national parks. The projects supported Three-River-Source National Park, Sichuan Administration of Giant Panda National Park, and the Qinghai area of Qilian Mountain National Park in the Yangtze River basin, and explored the possibilities for local communities around nature reserves with national parks as the main body to benefit from high-quality ecological products.

Main outcomes

(1) Ecological value

①In the Yangtze River basin, practices including grazing management, grassland restoration, franchised operations of nature experience, and honeybee-friendly industries, Huatai Securities helps promote the balance between ecological protection and community development, and help maintain the healthy ecosystem of the community-based nature reserves in the Yangtze River basin, covering an area of 2,000 km^2.

②In the source region of the Yangtze River and the Yangtze River Delta, by using infrared camera traps, collars, population genetics and other methods, Huatai Securities supports scientific research institutions are supported to conduct research on climate change, the coexistence of snow leopards and common leopards (*Panthera pardus*) , urban landscape ecology, etc., to fill the gaps in domestic ecological research.

③In the middle and lower reaches of the Yangtze River, 11 representative species in the basin are protected and their habitats restored and improved, and urban wildlife baseline data

"One Yangtze River" Carnival

'One Yangtze River' Sustainable Development Forum

are collected through citizen science projects.

(2) Social-economic value

①A demonstration of financial enterprises supporting ecological protection. Huatai Securities has kept funding and providing manpower to the "Yixin Huatai One Yangtze River" project, and publicizing the project widely through the capital market, news media and Internet, and has motivated Shanghai Stock Exchange Public Welfare Foundation, Huatai Securities(Shanghai) Asset Management Co., Ltd., and Renaissance Nanjing Olympic Center Hotel and other institutions to support ecological conservation cause.

②Promoting cross-industry dialogue and collaboration on biodiversity protection. The "One Yangtze River" Sustainable Development Forum has set up a platform for dialogue between ecological protection and capital market, and through dialogue between ecological protection authorities, scientific research institutions, environmental social organizations and securities regulatory authorities, listed companies and representatives of the financial industry, pushing for the in-depth linkage between ESG rating, investments and biodiversity conservation.

③Helping raise public awareness of nature protection. Consolidate public welfare resources to carry out citizen science projects, guide the public to participate in scientific research and investigations, observe and record nature through scientific experience, lectures, exhibitions, etc., and help the group of citizen scientists.

About the applicant: Huatai Securities is a leading technology-driven securities group. In 2018, it set up the "Yixin Huatai One Yangtze River" charitable ecological conservation project to work with all sectors to conserve biodiversity in the Yangtze River basin, promote dialogue and cooperation between ecological protection and capital market, drive strategic investment in green finance and guide capital towards charity.

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Free Flying Wings Civilian Conservation Project

SEE Foundation

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making & implementation; Financial support mechanisms

Target: Avifauna

Location: China

Year of Implementation: 2008

Background

The Free Flying Wings project is a comprehensive ecological conservation project to protect the most endangered migratory birds and their habitats in China. The project gives priority to the protection of more than 100 wetlands to be protected urgently and 24 species of rare and endangered migratory birds. Through the mode of initiated by social organizations, invested by enterprises, participated by the public, the project has established a Cosnervation Demonstration Base to carry out positive wetland protection by building a protection network of social organizations complementary to the governmental natural conservation system. Therefore, the government and society would be mobilized to jointly protect the most endangered migratory birds and their habitats in China.

Main activities

The three major strategies of the project are to build a grassroots conservation network, establish a conservation demonstration base, and carry out scientific research and policy promotion.

①Until 2021, the Free Flying Wings network has supported 65 private conservation organizations to carry out 142 projects, covering 90 wetland plots in more than 20 provinces, autonomous regions and municipalities directly under the Central Government in China. The project covers basic bird survey, wetland patrol and data collection, publicity and education, anti-poaching, and wildlife rescue. More than 6,500 bird surveys and patrols have been carried out, covering an area of 4,000 km^2. At the same

Bird monitoring

time, more than 1,100 various publicity and education activities have been carried out, covering over 750,000 people.

②In terms of the construction of the Conservation Demonstration Base, Free Flying Wings continues to promote the establishment of protected areas such as Tiaozini Wetland in Jiangsu Province, Luannan Wetland in Hebei Province, Old Yellow River Course Nature Reserve in Henan Province, Xinghua Bay Wetland in Fujian Province, and Bainiao Lake Wetland in Xinjiang Province.

③For the 24 rare and endangered birds followed by the project, Free Flying Wings has carried out special protection and scientific monitoring activities. Through the development of special protection actions, the basic information of the main distribution range, population size, conservation status, threats to these rare and endangered birds in China has been basically grasped, which has built a solid foundation for further more targeted species protection and recovery actions.

④Free Flying Wings is active in policy advocacy, such as submitting proposals to the two sessions(the National People's Congress and the Chinese People's Political Consultative Conference) and seeking opportunities to publicize in the international community. The SEE Foundation has reached a cooperation agreement with the Department of Wetland Management and the Department of Protected Area Management of the National Forestry and Grassland Administration to assist the government in carrying out targeted capacity-building activities, actively participated in the second phase of the application of the Yellow Sea and the Bohai Sea Wetlands for the world heritage as well as the hosting of international protection meetings, and conducted achievement and experience exchange activities to expand the international influence.

Main outcomes

(1) Ecological value

①Contribution of the civil protection network to the unprotected areas: The project covers some of the unprotected wetlands and provides some baseline data of habitats and waterbirds of the unprotected wetlands. In addition, some direct measures have been taken to stop poaching and environmental damage.

②Contribution to migratory birds on the flyway: Of the 90 wetlands supported by the project, 58 are located in China's coastal areas, which play an important role in the protection of migratory birds in the flyway.

(2) Innovation

The project vigorously develops the public participation mechanism, promotes the growth of social ecological protection forces, guides the forces of the whole society to pay close attention to the unprotected areas with important birds that cannot be reached by the official protection forces, covers the unprotected areas, and establishes a new bird and its habitat protection mode with public participation.

Poyang Lake (Lei Xiaoyong/Photographer)

About the applicant: the SEE Foundation, established in 2008, was initiated by SEE Conservation, and is committed to funding and supporting the growth of Chinese social environmental protection public welfare organizations, building a socialized protection platform with the participation of entrepreneurs, environmental protection welfare organizations and the public, and jointly promoting ecological conservation and sustainable development. Up to now, the Foundation has officially launched brand projects such as “100 million saxaul trees” and “Free Flying Wings”, directly or indirectly supported the work of over 800 social environmental protection welfare organizations or individuals in China, with public welfare expenditure exceeding 1.1 billion yuan, which has influenced and driven 600 million people to become supporters and participants of environmental protection.

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UNDP GEF Small Grants Program

UNDP/GEF SGP China Program

Approach: Financial support mechanisms

Targets: Forest; Grassland; Ocean and coastals; Urban; Farmland; Mountain; Arid and semi-arid area; Plants; Mammals; Amphibians; Avifauna; Marine creatures; Germplasm resource conservation

Location: China

Year of Implementation: 2009

Background

As the Global Environment Facility(GEF) is a funding mechanism for implementation of several multilateral environmental conventions, including the CBD. The Small Grants Program(SGP) , funded by GEF, aims to assist social organizations and other stakeholders to get more financial, policy, and technical support, and also serves as a powerful catalyst for social organizations and other stakeholders to come together to support community-based activities that help countries implement the CBD at the community level.

Main activities

Since its inception in China in 2009, the GEF SGP has supported 135 projects in 26 provinces, autonomous regions and municipalities directly under the Central Government of China, providing a total of USD 6.35 million in direct funding to Chinese social organizations. Of these, 53 projects in the area of biodiversity conservation were supported with USD 2.74 million. SGP primarily supports remote, vulnerable, underdeveloped and poverty-stricken communities, with grants going directly to local social organizations and community-based organizations(CBOs) , the project implementers approved by the National Steering Committee, with grants of up to USD 50,000 per project.

The program has played an active role in raising public awareness of environmental protection, promoting communities as conservationists of natural resources, addressing poverty with ecological

conservation tools, and promoting endogenous community development. The program's contributions go far beyond grants to social organizations and CBOs. By raising public awareness, building partnerships, and promoting policy dialogue, the GEF SGP creates an enabling environment for public and community participation in achieving sustainable development goals and addressing global environmental issues.

The funded biodiversity conservation projects' activities mainly relate to species and habitat conservation, wetland conservation, water conservation, forest protection, habitat survey and database building, establishment, alliance and recognition of community conservancies; development of ecotourism and nature education; market linkage of biodiversity-friendly products; sustainable management and use of natural resources; restoration of fragmented landscapes; revival of indigenous cultures and the strengthening of community autonomy.

In order to break down barriers, integrate the different focus areas of the GEF, link biodiversity conservation and sustainable development and other social issues, and produce a greater impact with limited funds, the SGP began in 2015 to move from an evenly spread effort across the country to concentrating on specific local conservation projects. Using the landscape approach, SGP highlights three key landscapes: the high mountain valley landscape of the Hengduan Mountains in Yunnan Province, the alpine grassland landscape of the Sanjiangyuan region in Qinghai Province, and the coastal zone of Beibu Gulf, and formed local conservation networks.

Monitoring by a Water Conservation Team

Main outcomes

(1) Ecological value

By empowering communities, the SGP protects important species and ecosystems at the global, national, and regional levels. The SGP supports the establishment, recognition, and development of indigenous and community conserved areas(ICCAs) in China, with 47 ICCAs supported and approximately 800,000 hm^2 of biodiverse and culturally diverse areas and important ecosystems protected.

Ecological Culture Festival

(2) Social-economic value

The program has demonstrated a successful model of community balancing ecological conservation and livelihood development in ecologically fragile, biodiversity-rich, and poverty-alleviation priority regions. Program mobilized multi-stakeholders to participate in ecological protection, poverty reduction, and sustainable community development, benefiting a total of 420,000 households. In addition to filling in the gaps in the government's large-scale environmental projects, the program focuses on building a platform for cooperation between private organizations and local governments, forming a model for multi-stakeholder participation in environmental governance. For the results of the program, *China Weekly* issued two monographs in November 2016 and December 2017, including five cases of ICCA in the field of biodiversity and positive evaluations of the SGP by experts and scholars, which generated strong reactions nationwide. Several projects supported by the program have been disseminated as case studies in the GEF network and have expanded its international influence.

(3) Innovation

①The program is based on the principle of "think globally, act locally" and adopts a bottom-up approach to support local social organizations to participate in local biodiversity conservation and global environmental governance. The program systematically introduced the concepts of ICCA, and conserved areas governance types as well as the registration of ICCA with UNEP-WCMC to Chinese social organizations and community. The project has supported the establishment of 47 ICCAs, serving as a model for community-based conservation of important biodiversity, ecosystem services, and cultural values through customary laws, including village rules and regulations, and religious traditions.

②The program has promoted the establishment of the China Working Group on ICCA, with members from UNDP, academic institutions, and conservation organizations, which has played an important role in gaining recognition for ICCA in China and internationally.

③Using a landscape approach that combines ecological conservation, poverty alleviation, and community empowerment, the program provides best practice examples for sustainable community development and rural revitalization.

Project community

About the applicant: The United Nations Development Programme Global Environment Facility Small Grants Program(UNDP/GEF SGP China Program) , established in 1992, is a joint project of the Global Environment Facility and is implemented by the United Nations Development Programme. The program provides funds for sustainable development projects implemented by local social organizations, especially indigenous people, women and youth in 125 countries around the world to promote community-based innovation, capacity building and empowerment. The program has supported more than 20,000 community-based projects around the world, and is committed to protecting biodiversity, mitigating and adapting to climate change, preventing land degradation, protecting international waters, minimizing the impact of chemicals and developing sustainable livelihoods.

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PARTNERS Principles for Community-based Conservation

Snow Leopard Trust

Approach: In-situ conservation

Targets: Mountain

Location: Snow Leopard Range Countries

Year of Implementation: 2016

Background

Historically, conservation approaches have tended to exclude local communities and restrict traditional access which has often led to their marginalization and disenfranchisement. Community-based conservation approaches focus on the practice of conservation being equitable, just, and inclusive. Practical tools for respectful and effective ways to engage with local communities as equal partners in conservation have been generally lacking.

Main activities

To address this gap, the Snow Leopard Trust(SLT) and its partners have developed a pioneering approach and a training program called PARTNERS Principles for community-based conservation which has proven effective at building capacity of frontline conservationists to engage local communities in wildlife and habitat conservation. The PARTNERS Principles(PP) (Presence, Aptness, Respect, Transparency, Negotiation, Empathy, Responsiveness, and Strategic support) were distilled from two decades of conservation experience, and from ideas in applied ecology, conservation and natural resource management, community health, social psychology, rural development, negotiation theory and ethics. Rather than being prescriptive, this program was developed as an immersive training based on sharing of and learning from both positive and negative experiences of practitioners.

Sharing back the outcomes of field research carried out in community-managed rangelands can create interest and help secure active participation by locals for their conservation

Using the PARTNERS Principles approach, SLT teams have been working with over 150 local communities, who are protecting about 150,000 km^2 of snow leopard habitat. They have been recommended for conservation capacity enhancement by the Global Snow Leopard and Ecosystem Protection Program.

2016—2020 PARTNERS training program was created and piloted, trained 20 PP trainers and over 200 practitioners from 20+ countries.

In 2020, a helpline was launched to help frontline conservationists solve problems in real time.

The approach makes it possible for any conservationist, anywhere in the world, to achieve conservation ethically while bringing respect and the rights of local communities into focus.

Main outcomes

(1) Social-economic value

The PARNTERS approach aims to improve the practice of conservation by bringing PARTNERS knowledge and skills to conservationists in all snow leopard range countries, and, to other ecosystems and countries across the world.

The PARTNERS approach can help improve the practice of conservation globally. It hones the skills of interested practitioners in community-based conservation, thereby helping enhance the status of species and ecosystems while promoting human welfare and inclusion.

(2) Innovation

The philosophy behind the project is to ensure that conservationists are equipped with the ethical principles and effective means of creating partnerships with communities in their respective landscapes.

About the applicant: The Snow Leopard Trust(SLT) aims to protect the threatened snow leopard and its mountainous habitat through rigorous science, respectful community engagement, stakeholder partnerships, knowledge exchange and supportive conservation policies.

CHAPTER VII

Technical Innovation and Data Tools

Connected Conservation

Connected Conservation Foundation

Approaches: In-situ conservation; Technological innovation

Targets: Forest; Grassland; Farmland; Mountain

Location: South Africa, Kenya

Year of Implementation: 2015

Background

The IPBES 2019 report shows that more than one million species are at risk of extinction. United Nations is working to increase the protected areas from 15% to 30% of the planet by 2030. Protected areas are a cornerstone of conservation practice to safeguard our natural heritage, but the following are common challenges facing Africa's protected areas and its wildlife.

Illegal wildlife poaching rates surged during the pandemic, and local livelihoods remain devastated by the loss of tourism. In South Africa, every day, a rhino and elephant are killed.

Human-wildlife conflict (HWC) events are increasing as the space for nature shrinks and the competition for resources rises. When elephants raid crops or when carnivores prey on livestock, it can damage the local perception of wildlife and lead to wildlife and human deaths.

Habitat destruction is a threat to wildlife. Suitable habitats must be maintained, yet only 15% of the world's land is protected. The amount of protection must increase so that important ecosystems can sustain life on earth. Bush clearing, charcoal burning, overgrazing of grasslands by livestock must all be managed to ensure enough resources for the co-existence of people and wildlife.

Technologies are vital in helping deliver the UN's goals and reversing declining species population trends.

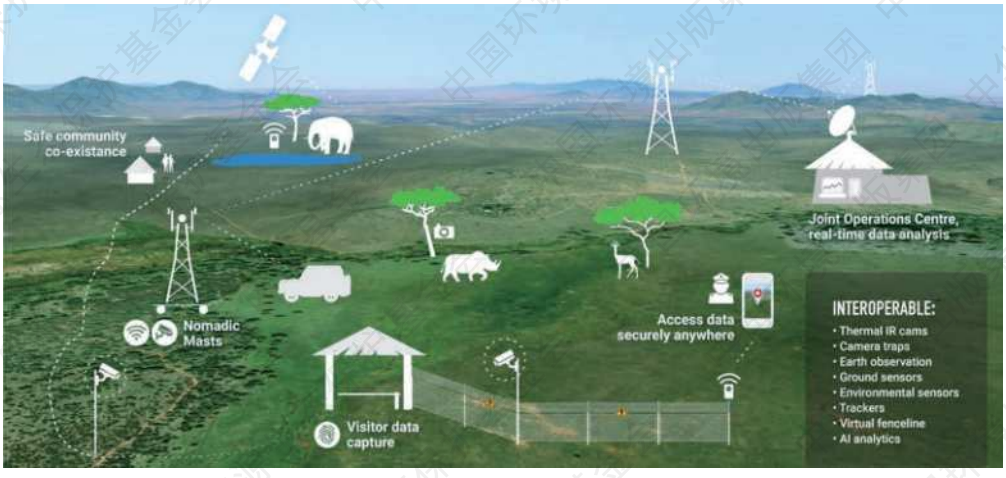
Main activities

①A Reserve Area Network for protected areas brings together communications, the latest sensors

and network connectivity to vast, remote landscapes. Alerts, conservation intelligence and live video can be shared from strategic locations to a central operation center. Solutions range from simply providing internet connectivity at Parks Headquators to more advanced systems that deploy thermal cameras at fence lines and a LoRaWAN network of sensors to track people, rangers, visitors, vehicles, natural resources and wildlife. The technology gives rangers around the clock visibility across their reserve. It provides an early warning of conservation issues so rangers can respond to stop poaching and human-wildlife conflict before it can occur.

②The Project combines network infrastructure, digital radios, data servers at operation centers, boundary based incursion detection with long-range thermal cameras, GPS tracking, real-time video PTZ(Pan-Tilt-Zoom) cameras, camera traps and low power LoRa WAN based sensors to monitor electric fences and manage environmental resources such as water. All of the above is integrated into the alerting platform, where Artificial intelligence (AI) is used to filter information, and this is visualized through Vulcan's Earth Ranger software. By enabling real-time data collection and analysis, the project also helps improve protected area management effectiveness and increase the speed of decision-making and response.

③In 2021, Connected Conservation is proud to add new technology partners Microsoft and Airbus Foundation, alongside founding technology partners Nippon Telegraph and Telephone (NTT) and Cisco. Newly signed agreements will couple Airbus high-res satellite imagery with Microsoft, NTT and Dimension Data's cutting-edge AI and on-the-ground technology to add critical new data and intelligence to Connected Conservation Foundation's existing solutions. These new projects aim to expand ranger visibility and protection to an additional 1,000 km^2 for biodiversity and their habitats.



A local network of sensors and cameras to monitor and protect wildlife and people

Landscape Installing enabling infrastructure for connectivity and communications

Project's overall impacts includes:

—Partnering with five sites over two countries;

—Connectivity, communications for real-time sensing covering 1,000,000 hm^2, helping rangers protect more than 30 threatened species;

—Equipping four joint operations centers as hubs for intelligence and analysis;

—more than 100 rangers equipped with connectivity and communications;

—96% reduction in poaching in the pilot project in the first 18 months(when coupling technology with excellent conservation management) .

Main outcomes

(1) Ecological value

Sport Beattie, CEO, Game Rangers International said: "IUCN talks about the ideal recommended ranger ratio to be 1∶50 per km^2, but using technology, we can extend our ranger ratio beyond 1∶100."

Over the last five years, Connected Conservation Foundation in South Africa built a point-to-multipoint radio area network that covers 62,000 hm^2. The technology has helped field teams achieve a 96% reduction in poaching during 2017 and 2018.

Communication devices essential to keep people and wildlife safe

Across the world, rangers play an indispensable role in protecting biodiversity and ecosystems and work in challenging conditions. Researchers found that only 43.2% of rangers said they always had access to communication devices on patrol or outposts in a ranger working conditions survey in Kenya. This statistic is alarming. Connected Conservation partners have extended secure connectivity, communications and LoRaWAN coverage across important conservation areas. This technology allows the operations room to track ranger patrols from GPS coordinates communicated from their radios.

(2) Social-economic value

The illegal wildlife trade undermines the rule of law and incentivizes local crime. Connected Conservation's technology solution works to safeguard wildlife and also provides peace and security to surrounding communities. Additionally, Connected Conservation helps local peace ambassadors use its communications and data analysis technologies to work with communities and mitigate conflict.

(3) Innovation

Protecting wildlife and ecosystems requires collaboration and a multi-disciplined approach. The Connected Conservation Foundation solution was first-of-its-kind, a proactive solution combining cutting edge technologies from Cisco, NTT and Dimension Data to detect and track the movement of people across protected areas.

About the applicant: The Connected Conservation solution was founded in 2019. Connected Conservation Foundation works to protect wildlife and ecosystems, provide local education and support communities through technology. By uniting the collective capabilities of local partners, technology leaders, and conservationists, the foundation can apply technological solutions to solve conservation challenges. Based on the pilot's long-running success, Connected Conservation Foundation has scaled to other sites across Africa, now with five long-running projects in Kenya and South Africa.

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PREVISIA: Artificial Intelligence Platform for Identifying Deforestation Risk in Brazilian Amazon

Fundo Vale – Associação Vale para o Desenvolvimento Sustentável
(Vale Fund –Vale Association for Sustainable Development)
Approaches: Publicity & advocacy; Policy making and implementation; Technological innovation;
Target: Forest
Location: Brazil
Year of Implementation: 2020

Background

The Amazon rainforest has long been recognized as a repository of ecological services for the world. The biome hosts the richest biodiversity of any ecosystem on the planet, and plays a critical role as part of global systems, as well as hemispheric hydrological systems. The over 3 million species that live in the rainforest and the over 2,500 tree species(or one-third of all tropical trees that exist on earth) help to create and sustain this vibrant ecosystem.

Castanha(*Bertholletia excelsa*) , the special nuts of Brazilian Amazon

In the Amazon, species are threatened when human activity encroaches deep into the rainforest. From August 2018 to July 2019, the Amazon lost over 9, 850 km^2 of forest — an area equivalent to over 1.8 million football fields or 1.5 times the size of Shanghai — signifying the highest rate of deforestation in this decade. There is a growing likelihood of massive-scale deforestation causing the Amazon rainforest to reach a "tipping point." This means that the hydrological cycle would be disrupted to the

point that it triggers a massive forest "die-back", and with it there would be a loss of an immeasurable amounts of biodiversity.

Main activities

Ensuring that the only forecast is a sustainable future: this is the purpose of PrevisIA, an innovative platform that uses AI to indicate areas at risk of deforestation in the Brazilian Amazon biome. It uses technology to predict imminent destruction and provides data to prevent it.

Created in partnership with Amazon Institute of Man and Environment(Imazon) , Microsoft and Fundo Vale, PrevisIA analyzes a set of variables to indicate the areas at greatest risk of deforestation in the biome. Among them are data on topography, land cover, legal and illegal roads, urban infrastructure and socio-economic factors. To perform this analysis, the tool relies on an AI algorithm developed by Imazon and with advanced resources of Microsoft's Azure computer cloud.

In addition, PrevisIA publishes its analyses in a control panel open to the public and with accessible data visualization resources, so that people from all areas can easily find the available information.

Besides the heat map, the platform indicates the total area and the number of municipalities, conservation units, indigenous lands and rural settlements under deforestation risk in the Amazon. The tool also enables analysis by state and provides rankings of states and municipalities most likely to have forest areas destroyed. Besides providing strategic data to public agencies that have the duty to protect the forest, the tool enables the engagement of the whole society in the defense of the Amazon.

Imazon has accumulated a deep set of experiences in regards to actions for monitoring deforestation in the Amazon. For almost 13 years it has been developing The Deforestation Alert System(SAD) , a tool for monitoring the Amazon based on satellite images, developed by Imazon in 2008. It provides monthly reports on the rate of deforestation and forest degradation in the region. In addition to SAD, Imazon also developed a model to approach short term deforestation prediction that: couples probabilistic and geostatistical models; provides probabilistic and uncertainty estimates; produces predictions of the locations of new deforestation events with over 90% accuracy.

How important is the PrevisIA solution for the planet?Avoiding deforestation and saving Amazon biodiversity efforts

Extractivism Depends on Forest Conservation in Brazilian Amazon

focus on locating where deforestation has happened and providing information about areas in imminent risk of deforestation. This requires prioritization of prevention measures.

Policy Effectiveness: Overall, public policies for nature-based conservation alongside socio-economic development of the Amazon do not robustly assess deforestation risks and impact. The model can be used to more effectively assess different scenarios for policy implementation.

Better decision making: Deforestation risk modelling allows for better decision-making on how to allocate resources to maximize conservation impact.

Main outcomes

(1) Ecological value

PrevisIA could be an instrument to support world campaign to achieve zero net deforestation in Amazon, protect essential resources, mitigate climate change and increase the people's general prosperity.

(2) Social-economic value

The Amazon basin is home to 30 million people, as many as the combined population of Tokyo, Mexico City and New York City. With reduced forests, people are less able to benefit from the natural resources these ecosystems provide, which can lead to increased poverty. Moreover, nearly one million Indigenous people in Brazil call the Amazon rainforest their home. It is necessary to promote a sustainable economy, capable of supporting the local population at a higher income level and with lower environmental impact, by adopting economic practices with higher productivity per unit of area. The PrevisIA Platform can also be used as a tool to measure avoided deforestation in the carbon market, in arrangements of payment for environmental services or even in the offer of financial credits for more sustainable activities in the biome, which besides generating income for the local population brings along environmental sustainability.

(3) Innovation

PrevisIA, launched in August, 2021, will take the practice of predicting the "where", "why", and "how" of Amazon deforestation to another level.

About the applicant: Fundo Vale is a development and investment fund whose mission is to promote positive social and environmental impact solutions that strengthen a sustainable, fair and inclusive economy. It was created by the mining company Vale, and was envisioned to play a critical role in the company's commitment to be a protagonist in conservation and biodiversity while also promoting sustainable economic development.

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UN Biodiversity Lab and Mapping Essential Life Support Areas

United Nations Development Programme

Approaches: Public participation; Policy making and implementation; Technological innovation; Sustainable use of biodiversity

Target: Biodiversity

Location: worldwide

Year of Implementation: 2018

Background

The world is deeply interconnected. The health of natural and human systems underpins the future of human societies, economies, and planet. Spatial data brings together intelligence generated from sources as diverse as satellites orbiting the earth, national and global science teams, and the deep place-based knowledge of Indigenous Peoples and local communities. The maps created by these data layers can provide a powerful resource to address our planetary crisis.

The UN Biodiversity Lab(UNBL) (www.unbiodiversitylab.org) provides access to global public data on people and planet in new ways to empower governments and stakeholders to take action. Its mission is three-fold: ① to democratize access to spatial data and analytic tools as a global public good; ② to support decision-makers to leverage spatial data for insight, priority-setting, and implementation;

UNBL homepage

③to empower stakeholders to use spatial data for monitoring and reporting. UNBL strives to provide a comprehensive offering that can support governments at all levels to deliver on internationally agreed goals and targets for nature, including the post-2020 global biodiversity framework, and achieve the 2030 Agenda for Sustainable Development. The UNBL convening partners, including the CBD Secretariat, UNDP, UNEP, and UNEP-WCMC work in dynamic partnership to ensure the sustainability of the platform over time.

Main activities

With over 400 of the world's best datasets on nature, climate change, and sustainable development, UNBL enables policymakers and other stakeholders to use spatial data to take action for people and planet. UNBL is a free, open-source environment that does not require any previous GIS experience. The platform provides the ability for users to:

- visualize core global public good datasets at the heart of decision-making on nature and sustainable development;
- access curated collections that integrate spatial data for insight and action;
- view and download dynamic indicators of change for any country in the world;
- create workspaces to securely upload national data and analyse it alongside global data;
- develop communities of practice that nurture data transparency and cross-sectoral collaboration;
- draw on the expertise of UNBL partners to develop national strategies and plans.

UNBL provided a critical resource that led to an 81 percent increase in the number of maps between Parties' Fifth National Reports and Sixth National Reports to the CBD . UNBL was shortlisted for the UN Secretary General's Innovation Award in 2018, received two highly coveted grants from the UNDP Innovation Facility (2017—2019) , and has been awarded two NASA(National Aeronautics and Space Administration) grants in partnership with top tier researchers(2017—2021) .

Building on engagement around the platform, in 2019, the UNDP convened world class scientists to develop approaches to use spatial data to identify where nature-based actions to protect, manage, or restore "essential life support areas"(ELSAs) and effectively implemented for biodiversity, climate, and sustainable development(https://unbiodiversitylab.org/maps-of-hope/). Working with Costa Rica as an initial pilot, this work brings together a powerful coalition of governments, social organizations, research institutes, and intergovernmental organizations. It has now been scaled to create customized national analyses for 11 additional countries based on their national context and priorities. With funding from the Gordon and Betty Moore Foundation, UNDP and partners are now creating an approach to map ELSAs that can be used for any country in the world via the UNBL platform. Initially available for three countries as a proof of concept, the UNBL partnership hopes to scale this functionality in the future.

Main outcomes

(1) Ecological value

Traditional conservation planning is suited for species conservation and ecosystem planning but does not account for the value of nature for human wellbeing. The use of spatial data to map ELSAs, guides integrated implementation of conservation and sustainable development. Spatial data available via UNBL can also be used to monitor the results of planned interventions, thereby provides a cohesive support package to countries to safeguard critical natural areas.

(2) Social-economic value

All human life depends on healthy ecosystems. Yet we are facing a biodiversity crisis. A million species are at risk of extinction, one out of five hectares of land is degraded; 90 percent of fisheries are fully or over exploited; and ecosystems are already facing collapse, from the Amazon to Antarctica. The loss of biodiversity jeopardizes more than half of our global economy, exposes 2 billion to water insecurity, and threatens the livelihoods of more than 2 billion people who depend on farms, forests, and fisheries to survive.

UNBL and associated work to map ELSAs support countries to prioritize the implementation of actions to protect, manage, and restore ecosystems that will enhance well-being and livelihood opportunities available around the world, while also helping Parties to deliver on their commitments to the three Rio Conventions and the 2030 Agenda for Sustainable Development.

(3) Innovation

This exercise is one of the first of its kind globally. Maintaining a healthy planet where people and ecosystems thrive requires reliable, timely, decision-relevant information. While the number of global, biodiversity-based information sources grows daily, few are accessible and curated in ways that meet the needs of policymakers at the national scale. UNBL recognizes that regardless of how much data is generated at the global scale, countries need a mechanism to assess its relevancy to their country. The program brings together a best-of-class scientific approach with deeply rooted national expertise to identify national policy mandates and priority targets.

About the applicant: As the United Nations lead agency on international development, UNDP works in 170 countries and territories to eradicate poverty and reduce inequality. UNDP' s work is concentrated in three focus areas; sustainable development, democratic governance and peace building, and climate and disaster resilience. UNDP is one of the four convening partners of UNBL, and the lead agency developing and implementing ELSA maps. This best practice was submitted by UNDP on behalf of the UNBL Partnership.

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AI for Biodiversity

Microsoft(China) Co., Ltd.

Approaches: Public participation; Publicity and advocacy; Financial support mechanisms; Technological innovation;Sustainable use of biodiversity

Targets: Mammals; Amphibians; Avifauna

Location: China

Year of Implementation: 2019

Background

In China, nonprofits dedicated to biodiversity conservation are facing common challenges including:①Workflow relies on manpower. The efficiency caused by laborious work limits the development of nonprofit organizations. ②Rely on people to identify whether the image data contains wildlife or not. The time-consuming process results in losing out on timeliness of the data outcomes. ③The collected data are stored separately and correlations need to be established manually. Hence nonprofit organizations lack data centralization and intellectualized analysis, so it's difficult to get actionable or valuable information from these data.④Lack tools for data visualization. The problems or findings hidden behind the data cannot be identified in a timely, clear, concise, and intuitive manner. This sets a high threshold for non-professionals to understand the data and join in biodiversity actions.

Shan Shui Conservation Center (Shan Shui) is one of China's leading nature conservation nonprofit organizations. Shan Shui also has a strong will of digitalization. Sharing the same vision of accelerating the integration of social public welfare and technology, Microsoft and Shan Shui established the partnership on "AI for Earth".

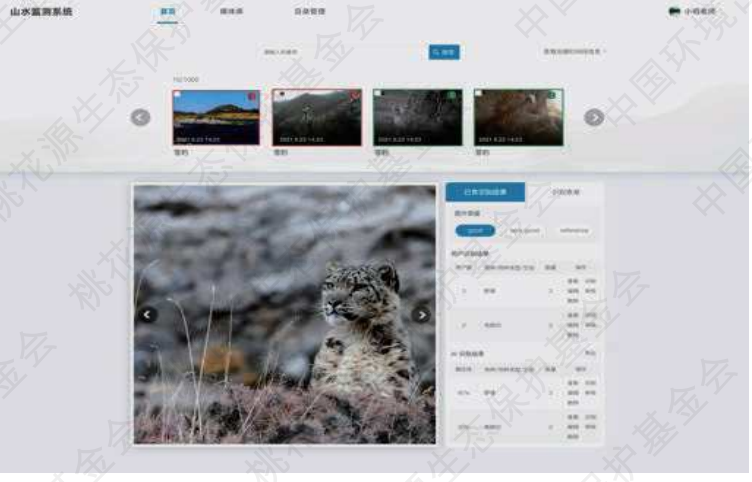
"AI for Earth" is a USD 50 million, 5-year commitment from Microsoft to put AI at work for the future of the planet. Launched in July 2017, its focus areas are climate change, agriculture, biodiversity and water. It puts cloud and AI tools in the hands of those working to solve global environmental challenges.

Main activities

①To improve efficiency and save manpower from laborious and repetitive work, empowered by Microsoft Azure and AI technology, Microsoft supported Shan Shui to develop a platform which addresses the major problem of collecting and processing data. Shan Shui can use Camera Trap API (application programming interface) to identify and classify camera trap images automatically by determing whether there are wildlife captured in the picture or not, so as to assist in manual processing. Besides good and stable performance and privacy protection, this tech solution also enables Shan Shui to improve their data primary screening workflow efficiency by 50% with high accuracy of 90% on image recognition, as a result of which Shan Shui spends less time on annotating images and more time on valuable things like conservation innovation.

②To better manage and use data, Microsoft supported Shan Shui in building a Power BI (data visualization) solution to visualize data collected from "Species intelligence" citizen science program—a program engaging the public to join nature observation actions and contribute to biodiversity data collection. Power BI enables Shan Shui to visualize and analyze the vast data, so that it can better interact with the public, and provide data basis for experts/ policy makers/decision makers.

③Moreover, Microsoft supported Shan Shui to develop a Biodiversity Impact Assessment Tool (BIA) in order to raise environmental awareness among the public. Empowered by Azure, BIA is designed to provide biodiversity information queries for professionals, citizes, educators and policy makers. By selecting a site or region of interest, this tool will tell the distribution of threatened species in this area with desensitization. For policy makers or land planners, this provides supporting information for decision making with ecological considerations; For citizens and educators, this is a platform for them to know nature and hence love nature.



Camera Trap API based on Microsoft Azure, optimizes data collecting and processing

Microsoft believes one of the valuable assets for nonprofits is data. Microsoft provides trustworthy technology, especially cloud resources for data storage and processing, protecting Shan Shui's privacy, data and intellectual property. Microsoft lawyers also supported Shan Shui by giving a training to illustrate related regulations and laws.

The partnership also includes advocacy, to call for broad participation

and attract more attention from the public.

Main outcomes

(1) Ecological value

Microsoft puts cloud and AI tools in the hands of those working to solve global environmental challenges. In this partnership, Microsoft enables Shan Shui to work more efficiently and sustainably on biodiversity conservation. Indirectly, this project enabled biodiversity protection in aspects of what technology can contribute.

(2) Social-economic value

①Applying AI and other technology in biodiversity conservation can create positive impact and boost more cross industry cooperation.

②Biodiversity conservation needs data support, public engagement and policy advocacy. In this partnership, Azure, AI and other technologies enabled data process and storage; Power BI enabled data analyzing and visualization, in other words, to make the vast data valuable and understandable; They help accelerate public engagement in biodiversity conservation; and hope to support research, decision making and policy making.

Shan Shui's citizen science data illustration page using Power BI solution to visualize and analyze data

Biodiversity Impact Assessment Tool(BIA)

③This tech solution is a combination of Artificial Intelligence (AI) + human ingenuity (HI). While there are concerns about human's jobs being "replaced by machines", or AI will be a threat or a risk to human society, this solution demonstrated that AI technology has the power to amplify human ingenuity and extend our capabilities. AI and HI could take different roles and complement each other.

(3) Innovation

①AI and Cloud empowered image recognition technology was an innovative way applied for wildlife protection in China which achieved automatic identification and classification ofcamera trap images.

②BIA tool can support integrating environmental and social concerns into decision making processes.

About the applicant: Microsoft is a company that enables digital transformation in the era of an intelligent cloud and an intelligent edge. As a technology company with a deep commitment to sustainability, Microsoft believes that it shall extend its responsibility beyond its own operations to innovating extensively towards a healthier and better future. In 2017, Microsoft announced the "AI for Earth" program, aimed at using the power of artificial intelligence to solve some of the biggest environmental challenges of our time, focusing on climate change, agriculture, biodiversity and water.

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Individual Recognition and Citizen Science Tool for Chinese White Dolphin

China Blue Sustainability Institute

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Technological innovation

Targets: Ocean and coastal; Mammals; Marine creatures

Location: Pan-Sanniang Bay, Guangxi Province, China

Year of Implementation: 2019

Background

Chinese white dolphin(*Sousa chinensis*) is the only marine dolphin named after "China" and a national Class-Ⅰ protected animal. It is called "Giant Panda of the Sea" and "National Treasure of the Sea" due to its rarity. In China, Chinese white dolphins are mainly distributed in the southeast coastal waters to the south of the Yangtze River, totaling at least eight populations of about 6,000 individuals. However, the development and utilization of coastal waters and the process of urbanization worsen the prospects for the survival of Chinese white dolphins. According to statistics, the number of Chinese white dolphins in the Pearl River Estuary-Hong Kong is decreasing at a rate of 2.46% per year.

The Development of Individual Recognition and Citizen Science Tool for Chinese White Dolphin Based on Tencent Cloud AI(iDOLPHIN) project focuses on the small population of Chinese white dolphins in Pan-Sanniang Bay(continuous sea area centered on Sanniang Bay) while taking into consideration other small populations in the sea areas of eastern Guangdong Province and Xiamen Bay. From three different aspects (for example, small population conservation research collaboration, photo-identification data standardization, and citizen science tool development) , a crowd-sourced conservation method that combines science, community, public welfare organizations, and Internet enterprises is practiced, enabling more people to participate in the conservation of Chinese white dolphins.

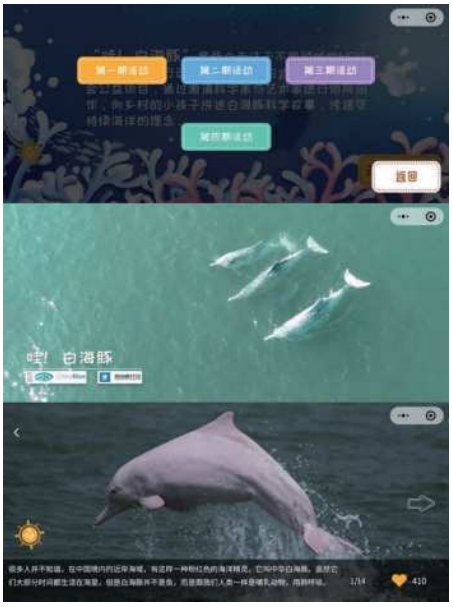
Chinese white dolphins

Main activities

①In terms of small population conservation research cooperation, iDOLPHIN analyzed the habitat use, the population structure of white dolphins, and human interference in Pan Sanniang Bay, to evaluate the population status, and develop priority protection plans for different threat factors by improving the resolution of photo-identification data in time and space through data and technical cooperation, and by combining historical data since 2011. At the same time, we made a comparison with other small populations in the sea areas of eastern of Guangdong Province and Xiamen Bay, analyzing the possible extinction paths of small populations of Chinese white dolphins.

②For the standardization of photo-identification data, two small population data sets(>100,000 photos, 258 individuals) from Shantou and Qinzhou were used. The cross tests of three main modules(fin detection, fin scoring, fin matching) and one optimization module were carried out. CNN(Convolutional Neural Networks) could achieve an average accuracy of 89.55% (Top-1) and the accuracy was greater than 95% in high-quality photos. The optimization module based on group information can improve the identification accuracy of low-quality photos by about 3%, thus realizing the artificial intelligence standardization of photo data processing. At the same time, we achieved platform transplantation with Tencent cloud AI, with a recognition speed of 11 seconds per photo, and completed the development of online cloud collaboration tools.

③ Regarding the development of citizen science tools, iDOLPHIN, by combining the data of individual identification with cloud computing with the supporting WeChat mini-program, has improved the community's awareness of local species and public participation ability while developing citizen science tools. Meanwhile, through cooperation with rural education social organization "Shoulder Action" , iDOLPHIN aims to carry out education on marine biodiversity in rural schools, developed a WeChat mini-program "Wow White Dolphin" and rural children's science education with marine mammals as the theme, and collaborated with *Shandong Science and Technology Press* to develop children's science books themed on "Wow! White Dolphin", which filled the blank space of marine biodiversity in science books for children.



"Wow! White Dolphin" mini-program

Main outcomes

(1) Ecological value

Only after years of data accumulation and analysis, researchers can know the social behaviors, courtship and predation habits of white dolphins, thus enabling them to understand the relationship between dolphin migration, mobility and environment, and make scientific plans for the conservation of white dolphins. Using the Tencent Cloud AI technology, the iDOLPHIN project can quickly carry out "dolphin face recognition" , greatly improving the speed of individual recognition of Chinese white dolphins, freeing researchers from huge and rigid data processing, and providing basis for scientific research and protection.

(2) Social-economic value

At present, there is a lack of citizen science tools and public participation platforms for white dolphins in China, and there are also gaps in creation of children's science books about indigenous species. The citizen science tools and the supporting WeChat mini-program developed by the iDOLPHIN introduce the conservation of Chinese white dolphins from the research field to the public.

(3) Innovation

①Standardization of photo-identification data and the use of artificial intelligence and cloud computing:

Identification of white dolphins by dorsal fin

In terms of technological innovation, photo-identification is combined with machine learning and cloud computing to realize the combination of scientific data and Internet technology, providing a reference for the automation, cloud collaboration and visualization of species data.

②Small population research methodology based on data collaboration and skill-sharing:

Employing data protocol, data sharing and technology synchronization are achieved while copyright is protected. Secondly, on the premise of improving data resolution, conservation agendas on different small populations of white dolphin were set to compare the differences in habitat use and social network of different the small populations in question and put forward protection strategies for small populations conservation.

③Use the Internet and AI cloud computing to develop citizen science tools:

Through the Internet and cloud computing, data visualization and public participation are realized, and convenient citizen science tools are provided while serving the data cloud collaboration of scientific research teams.

About the applicant: China Blue Sustainability Institute, established in February 2015, is the first non-profit organization in China dedicated to promoting the sustainable development of the fishing industry and building local blue public welfare circles. By advocating thinking and research approaches combining social, economic and environmental considerations and based on China's national conditions and culture, it unites all stakeholders to explore the way of harmonious development between human and nature.

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Tencent for the Planet

Shenzhen Tencent Computer System Co., Ltd.

Approaches: Public participation; Publicity & advocacy; Technological innovation

Target: Specifies diversity

Location: China

Year of Implementation: 2015

Background

Shenzhen Tencent Computer System Co., Ltd.(Tencent) pays great attention to issues related to biodiversity and the ecological environment. In 2015, Tencent launched the "Tencent for the Planet" Project to promote the harmonious coexistence of human and nature by exploiting the power of technology and the Internet.

Main activities

①Establishing a wildlife safety protection system. In 2015, "Tencent for the Planet" established the first direct online plantform for reporting illegal wildlife trade, united with the whole society to resist illegal online trade, and gradually formed a full-stack solution covering online reporting, assisting law enforcement agencies, and offline crackdown. These measures were successful in assisting investigations of major criminal cases of illegal trade in wildlife and their products.

②Promoting the government-enterprise-community cooperation. In 2018, under the guidance of relevant departments, "Tencent for the Planet" established a natural ecological protection advisory group with seven well-known ecological protection organizations to provide scientific guidance and professional support for Tencent and the Internet industry. Tencent has also worked with members of the "Coalition to End Wildlife Trafficking Online" to jointly introduce a set of technical specifications to effectively prevent illegal online trade in wild animals and plants. In 2020, Tencent, together with

academic institutions, ecological protection institutions, and related companies, jointly issued the first group standard *Control of Illegal Wildlife Trade on Online Platforms Group Standard* on the platform of the Internet Society of China.

③Exerting the power of Internet and technology, and exploring new modes of public participation. During the 99 Giving Day(annual public welfare activities jointly sponsored by Tencent Charity Foundation and relevant organizations) in 2021, under the guidance of the Executive Committee Office for COP15, "Tencent for the Planet" joined hands with the China Environmental Protection Foundation and the Paradise Foundation to carry out the "Connecting with Nature through the Power of Science and Technology" ahead of COP15. Based on WeChat, Tencent Foundation and other core products, Tencent carried out public science education and livestreams of visits to natural reserves. On the International Day for Biological Diversity in 2020, under the guidance of the Executive Committee Office for COP15, "Tencent for the Planet" launched the "Wildlife Protection Alliance" campaign, which reached millions of people. In the Spring Festival of 2021, "Tencent for the Planet" launched a public education campaign on wildlife safety, covering approximately 65 million people in 14 key cities across the country. On World Environment Day 2021, "Tencent for the Planet" and CCTV4 launched a wild animal protection game, Craz 3 Match, Protect Wildlife, in which more than 20 million persons participated. In 2020, "Tencent for the Planet" worked with nonprofit organizations such as the Paradise Foundation to launch the first Tencent Light Public Good Innovation Challenge. Nearly 3,000 contestants have developed applets to address social issues such as wildlife protection, which injected new technological innovations into biodiversity conservation.

Ecological protection advisory group for "Tencent for the Planet" was established

Invited to participate in “Debriefing of Operation Thunderball & Demeter V”

Connecting with Nature through the Power of Science and Technology–Live Streaming for Exploration in Nature Reserve

Main outcomes

(1) Social-economic value

Since its establishment, “Tencent for the Planet” has continued to carry out biodiversity conservation projects, influencing hundreds of millions of users. It was awarded as the WWF Natural

Ecological Guardian and Action Guardian Against Illegal Wildlife Trade. It has been affirmed by all walks of life and showcased responsibilities shouldered by China's Internet enterprises in the fields of conservation of biodiversity and construction of ecological civilization.

"Tencent for the Planet" has been invited by corresponding authorities and international organizations to participate in international exchange activities. In January 2020, the then Executive Secretary of the United Nations CBD visited Tencent and recognized its work in relevant fields. The Secretary-General of the CITES also affirmed the relevant actions of "Tencent for the Planet" in wildlife protection by the official news of UN.

(2) Innovation

①Innovation in protection mode of government-enterprise-community cooperation. Under the guidance of relevant departments, "Tencent for the Planet" launched the first direct online platform for reporting illegal wildlife trade, established the first natural ecological protection advisory group in the Internet industry, and promoted the preparation and issue of the first Internet wildlife protection group standard.

②Exploring the innovative form of Internet-based public education. "Tencent for the Planet" has carried out diversified public education activities. For example, in the "Connecting with Nature through the Power of Science and Technology" campaign, the public immersed themselves into the Jiulongfeng Protected Area of the Paradise through a live streaming of the WeChat Channels, and experienced new awareness raising models such as "Search" "Scan" "Red Packet Cover" and other functions in WeChat.

③Boosting the innovation of the biodiversity conservation concept by science and technology. Adhering to the concept of Tech for Good, "Tencent for the Planet" joined hands with related teams to actively utilize and open up emerging technologies and products such as artificial intelligence, Tencent Cloud, and applets to provide a practical platform for the application of science and technology in the field of biodiversity conservation.

About the applicant: Founded in 1998, Shenzhen Tencent Computer System Co., Ltd., (Tencent) is a world-leading Internet-based technology company that develops innovative products and services to improve the quality of life of people. By adhering to the concept of "value for users, tech for good", Tencent has been endeavoring to incorporate social responsibility into its products and services and promoting technological innovation, cultural inheritance and the sustainable development of society. In 2021, Tencent upgraded the strategy "Sustainable Social Value Innovation", and will continuously invest in and support environmental fields including carbon neutrality, food, energy and water.

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Snow Leopard Intelligent Identification and Monitoring Data Management Cloud Platform

Tencent Foundation

Approaches: In-situ conservation; Technological innovation; Sustainable use of biodiversity

Targets: Mountains; Mammals; Germplasm resource conservation

Location: Qilian Mountain National Park, Gansu Province, China

Year of Implementation: 2021

Background

The Qinghai-Tibet Plateau, which occupies a quarter of China's land area, is one of the most precious natural heritages in China. After development for more than 50 years, the Qinghai-Tibet Plateau is still a sparsely-populated area with healthy population of wild animals, including snow leopard known as one of the top carnivores. Snow leopard is not only a symbol of wilderness, but also an indicator species for the health of alpine ecosystems, so it needs tracking and protection. At present, scientific research on snow leopards is very limited, and information on snow leopard distribution and populations is extremely lacking. The global scientific survey area only accounts for 2% of the snow leopard habitat, which is far from the requirements for formulating a global snow leopard protection strategy.

Main activities

The Qilian Mountains, the fringe mountain system in the northeastern part of the Qinghai-Tibet Plateau, is an important distribution area of snow leopards in China. In April 2021, the Tencent team joined hands with WWF and OPF in Shenzhen. Through a field visit in the snow leopard habitat—Qilian Mountain National Park in Gansu Province, it was found that the snow leopard pictures from the infrared camera collected by the grass-roots managers and guards were extremely difficult to identify. Moreover, substantial problems such as large and complex data and the resulting low efficiency have seriously affected the progress of scientific data protection programs.

The Tencent team independently developed a data platform that includes infrared camera data, AI identification, and patrol data collaborative management in order to reduce the workload of data collection for grassroots managers and guards and free the frontline investigators from the tedious work of recording, labeling, and identification. It is an attempt to assist scientists and reserve managers in solving the dilemma of snow leopard investigation. This platform system provides AI species identification, data clouding, model building, and calculation functions, which can automatically organize and accurately analyze basic data, so as to assist scientists and professional conservationists in species monitoring and line transect surveys with higher quality.

Investigators are looking for animal tracks on Qilian Mountain

Photo of the Tencent team and WWF at the foot of the beautiful snow mountain

This system can also be used to screen a wider range of species after commissioning, handle the problem of data isolation, to formulate an effective research report, thereby assisting relevant departments in formulating scientific and effective biodiversity conservation measures. This system will also be shared with other countries where snow leopards are distributed, such as Nepal, Mongolia, and Kazakhstan. It can assist in investigation and protection of local snow leopards and their related species, and establish multinational cooperation to protect biodiversity. We want to help in the field of technology to build a "Shared Future for All Life on Earth".

Main outcomes

(1) Ecological value

According to *Status of Snow Leopard Survey and Conservation, China, 2018*, 60% of the world's snow leopard habitats are located in China, but the surveyed area of snow leopard habitats in China only accounts for 1.7% of the total. By piloting in China, this efficient and accurate data platform led by Tencent's technical team can improve data collection efficiency, enable grasping the distribution and population dynamics of snow leopards in China, formulating protection schemes based on

scientific data, and implementing protection actions, so that the population of snow leopards in China remains stable and gradually increases, thus promoting the formulation of global snow leopard protection strategies.

(2) Innovation

The innovations of this system are reflected in the following aspects.

①Using machine learning to establish a working paradigm of effective species identification. With the continuous increase in recognition data, the effective training of machine learning will continue to optimize the recognition effect. This product will get more accurate with more frequent use on the basis of continuous optimization and iteration.

Snow Leopard Investigators Ma Duifang(left) and A Cheng(right) are looking at the animals on the photo

②Opening up the cloud classified storage management of monitoring data and patrol data. A phased clear data model can be generated through the connection of daily patrol data and species monitoring data that have been identified and analyzed, which help protected area managers and scientific researchers to effectively understand species monitoring conditions and facilitate the development of more targeted species conservation plans.

③Excellent interactive experience design to lower the barrier to use. Tencent's user interaction experience design can effectively lower the barrier to use of the monitoring data platform, reduce the difficulty of learning and using for the staff of protected area and render a usable and easy-to-use platform.

About the applicant: Tencent Foundation, a national non–public fundraising foundation registered with the Ministry of Civil Affairs in June 2007, is the first charity foundation initiated by Internet company in China. Adhering to the concept of "Being Connector for Everyone Can Do Charity", Tencent Charity Foundation promotes the deep integration and development of the Internet and charity, the development of the charity industry by means of Internet technology and services and the construction of where "everyone can do charity".

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China Nature Watch—Mainstreaming Biodiversity Conservation

Shan Shui Conservation Center

Approaches: Public participation; Publicity and advocacy; Policy-making and implementation; Technological innovation; Sustainable use of biodiversity

Targets: Forest; Grassland; Ocean and coastal; Freshwater and wetland; Mammals; Amphibians; Avifauna; Freshwater creatures; Germplasm resource conservation

Location: China

Year of Implementation: 2014

Background

The change in land and sea use is the primary cause of the loss of global biodiversity. China has adopted many conservation measures, including the establishment of a nature reserve system and designation of the ecological redlines, which have effectively protected many important ecosystems, wildlife habitats, and genetic resources. However, due to the severe shortage in and asymmetry of biodiversity information, and the fact that biodiversity conservation is not the mainstream, there is still a large conservation gap: many important ecosystems and wildlife habitats are still outside the nature reserves and have not been effectively protected by laws and regulations. In these areas and even in some nature reserves, economic development and construction projects often destroy the natural environment, causing losses in both biodiversity and socio-economics, which leads to the contradiction between development and environmental protection.

In order to seek a win-win situation between development and protection, Shan Shui Conservation Center and a number of other conservation institutions jointly launched the project of "China Nature Watch ". This project aims to the application of biodiversity information data in the fields of planning, investment, and EIA (Environmental Impact Assessment) by strengthening the collection and promote the symmetry of biodiversity information. This project also aims to advocate for the inclusion of the project in

relevant policies to comprehensively mainstream biodiversity conservation.

Main activities

(1) Establishing nature watch database and conservation institute partnership

① It has established the Nature Watch Biodiversity Database, through a comprehensive review of the country's endangered species, ecosystems, and protected areas as well as collecting and structuring of the data.

② The project initiated and operates the "Nature Watch Joint Action Platform" and the "China Snow Leopard Conservation Network" to jointly carry out nationwide field surveys to supplement the species distribution data.

③ The project launched various platforms that display biodiversity data and have the public participate in data collection, for example, a nature watch website and a nature watch software.

Public participation in wildlife field survey

Field investigation and communication on construction EIA projects with biodiversity impact

(2) Nature watch report

Based on the data analysis of the protection status and gaps of different species, nature reserves, and forest ecosystems, the project released various reports, for example, *2018 China Snow Leopard Survey and Conservation Report* and *2019 Chinese Otter Survey and Conservation Report* and published 11 related research papers.

(3) Biodiversity impact assessment and risk warning

①Through participating in the Yunnan green peafowl case and other cases that have huge impacts, the project had cross-industry dialogues with the fields of planning, investment, and EIA in order to find a practical solution for the application of biodiversity data.

②Shan Shui developed and jointly released the Biodiversity Impact Assessment(BiA) tool with relevant management departments to identify how the planning and construction projects negatively affect the nature reserves and wildlife habitats through data superimposition and assess the impacts of such projects on biodiversity.

(4) Policy and public advocacy

①Shan Shui continues to pay attention to the fields of legislation, planning, investment, and environmental assessment, and advocate for the effective integration of biodiversity conservation. It has made multiple policy recommendations according to laws and regulations, the "14th Five-Year Plan", urban planning, and environmental assessment of construction projects.

②In 2020, Shan Shui has jointly launched policy advocacy for the amendment of *the Wildlife Protection Law* with a number of institutions, and carried out a series of publicity and advocacy for biodiversity conservation to the public. Project organized the "One Yangtze River" Sustainable Development Forum to carry out cross-field dialogues on biodiversity conservation and finance.

Main outcomes

(1) Ecological value

①The project has collected and summarized a large amount of baseline data on biodiversity, including the distribution data of fauna and flora and data of nature reserve, and established a structured database. So far, 1,985 species have been recorded, with more than 370,000 distribution data sets. There are more than 7 types of nature reserves, with a total of 1,162 digital boundaries recorded in the database, which laid a foundation for the application of data on scientific decision-making. The database has been updated through partnership agreements, which involves 20 social organizations, 6 National Parks/Protection Area Administrations, 6 scientific research institutions, as well as companies and individuals.

②The project has collected a large amount of development and construction data. And from more than 2.2 million pieces of public information on the EIA of construction projects, it extracted 182,000 pieces of such information on the EIA of construction projects. It has provided a basis for understanding its spatial relationship with biodiversity conservation and providing warnings for projects that seriously affect biodiversity.

③The project has boosted the application of biodiversity data in the fields of planning, investment, and EIA, etc., and developed data interaction tools to find solutions for enterprises, governments and the public to recognize, inquire about, and identify the risks that impact biodiversity.

BiA tools released at the "One Yangtze River" Sustainable Development Forum

④The project has integrated data analysis and research, policy analysis and conservation practice. Through releasing research results and conducting policy advocacy, it carries out cross-field cooperation and policy improvement in several areas that can play a preventive role in the loss of biodiversity, thereby boosting the mainstreaming of biodiversity conservation.

(2) Innovation

①Biodiversity big data supports decision-making. The project has abundant resources, for example, scientific research institutes, management departments and social organizations and enjoys its

own research capabilities. It can obtain a large amount of data related to species and nature reserves. And the proposed database will be the first and largest public biodiversity database in China, and partially solve the problems of the current situation, where there is insufficient biodiversity data and there is difficulty in summarizing such data. Through its ample experience and cross-field dialogues, the biodiversity data can be effectively transformed, and be applied across industries and fields, allowing different industries and fields to make scientific decisions that are beneficial to biodiversity conservation.

②Focusing on preventive biodiversity conservation. Starting from the early stages of planning, investment, and EIA that have not yet caused losses and focusing on preventing and reducing the irreversible loss of biodiversity caused by development and construction projects in advance, it shall reduce post-event accountability as well as the conflict between development and biodiversity conservation.

③Exploring cross-cutting dialogues and cooperations. The project strives to step out of the traditional fields and comfort zones of biodiversity conservation and seeks to actively engage in cross-field dialogues and collaborations with the fields of with legislation, planning, investment, and environmental impact assessment. The project aims to promote the formation and growth of cross-industry alliances for biodiversity conservation, so that each party will fully use their advantages, jointly explore how to mainstream biodiversity conservation and take corresponding actions.

④Innovative biodiversity impact assessment and warning tools. The BiA tool developed by the project is the first tool in China to assess the impact on biodiversity in the EIA for construction projects. The tool will continue to update and iterate its risk warning function in the future and is expected to be the first biodiversity data interaction tool with cross-industry application scenarios.

About the applicant: Shan Shui Conservation Center, established in 2007, engages in the conservation of species and ecosystems. Shan Shui pays attention to snow leopards, giant pandas and snub-nosed monkeys in the western mountainous areas of China, as well as nature around them. Shan Shui relies on the conservation practice of local communities and actions based on citizens' science, demonstrates conservation schemes, refines conservation knowledge and experience, and promotes ecological justice. Ecological justice is the vision of Shan Shui, aimed at realizing the harmony between human and nature, the combination of tradition and modernity, and the balance between bottom-up and top-down decision-making.


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CHAPTER VIII

Sustainable Use of Biodiversity

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Biodiversity Action Plans – Hibiscus in West Africa

Union for Ethical BioTrade

Approach: Sustainable use of biodiversity

Target: Arid and semi-arid area

Location: Nigeria

Year of Implementation: 2018

Background

A Biodiversity Action Plan(BAP) provides guidance in designing and implementing concrete practices on sustainable use and conservation of biodiversity when growing and sourcing natural raw materials.

Hibiscus(*Hibiscus sabdariffa* var. *sabdariffa*) is an annual herbaceous shrub native to tropical and sub-tropical countries; Drought tolerant and able to grow in poor soil; Often cultivated in Nigeria in low-input, labour intensive multi-cropping systems on land previously farmed; Its swollen red calyces are considered a specialty botanical product; Used in the herbal tea and beverage industry; Leaves often used for animal fodder and fibre; Has labour intensive processing.

In this dry wooded savanna, some native tree species function to stop land degradation induced by human activities. However, non-native trees with an economic value were promoted as part of afforestation programs. These trees adapted easily and are now competing with the native trees. The local ecological balance is at risk and increased desertification has become the most immediate consequence. Seasonal dry winds blowing from the desert do not face sufficient plant barriers, thereby resulting in soil erosion by blowing away soil particles and the nutrients that allow it to remain arable. Sand dunes are now visible in non-desert areas.

Main activities

This project put efforts in achieving the following goals.

(1) Improve soil conditions

Compost or manure application on farms:

①Organic fertilizers such as compost and manure improve soil physical, chemical and biological properties.

②Application of organic fertilizers increases soil organic matter content, a critical component of soil health as it contributes to the infiltration and storage of water, stabilizes soil structure, improves nutrient cycling, limits soil erosion, and many more vital soil functions.

Natural farming practices:

①Implementation of intercropping, sometimes with legumes, as well as crop rotation and allowing the land to lie fallow after three years of cultivation, ensures nutrients are reintroduced in the soil.

②No heavy machinery is used, ploughing is done with animals to ensure that soil structure and biodiversity are not under pressure.

Hibiscus flower

(2) Protect biodiversity on and off the farm

Prevent pests and diseases:

①Farmers reproduce their own seeds and use them the following year. In this process they take seedbed sanitation measures to avoid the spread of diseases. An agronomist from the sourcing company supports farmers as needed.

②Genetic variety is ensured since it contributes to increase plant resistance to pests and diseases. When one variety is not resilient enough, other varieties will compensate.

Reduce application of pesticides:

①Pesticides and chemicals are used only as a last resort. Implementation of Integrated Pest Management(IPM) is preferred. This includes prevention of pests and diseases, manual weed control, intercropping and the use of plant varieties adapted to local climatic and soil conditions.

Dried Hibiscus flower

②Farmers also increase the presence of beneficial plants and insects by creating habitats for them in and around the farms.

Main outcomes

(1) Ecological value

Project contributes to reforestation by planting native trees. Native trees function as barriers for seasonal, dry wind coming from the desert and are useful in preventing the soil loss that leads to

local people harvesting

desertification. Re-planting these trees helps restore this function. Reforestation costs, in terms of land for farmers, are offset by crop resilience due to improved soil.

(2) Social-economic value

Hibiscus is a source of income that can be grown in poor soil conditions. However, desertification is threatening soil quality to the point that soil conditions may no longer be suitable for hibiscus to grow. Actions to improve soil conditions will ensure that soil health is enhanced and that crops are resilient in changing ecological conditions.

Natural methods of pest control and prevention contribute to rebalance ecosystem structure, composition and function. They also enhance the resilience of smallholder and subsistence farmers, such as hibiscus growers who have limited access to external inputs.

(3) Innovation

The local company sourcing hibiscus promotes and subsidises the actions with technical and economic support; The managers of the UEBT certification program, and their team of agronomists at the company, identify the needs and suitable actions together with the farmers; Farmers are in charge of implementing some actions with economic and non-monetary incentives from the company; Technical staff at the company support farmers in implementation with extension services; Technical staff are also in charge of monitoring the implementation and assessing results; Actions and a workplan are defined by the sourcing company for several farmers. Monitoring begins one year after implementation.

About the applicant: Union for Ethical Bio-Trade (UEBT) is a non-profit association that promotes sourcing with respect. It works to regenerate nature and secure a better future for people through ethical sourcing of ingredients from biodiversity. It aims to contribute to a world in which all people and biodiversity thrive. UEBT sets good practices for how companies and their suppliers source specialty ingredients for beauty, food, natural pharmaceuticals, flavours and fragrances, herbs and spices sectors, among others. UEBT is internationally recognised for its work with companies on ethical sourcing of ingredients from biodiversity.

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Coastal Carbon and Biodiversity Corridor(CCBC) Program in Indonesia

Yagasu

Approaches: Sustainable use of biodiversity; Access and benefit-sharing of genetic resources

Targets: Forest; Grassland; Ocean and coastal; Flora; Mammals; Amphibians ; Avifauna; Marine creatures; Mangrove fauna

Location: Indonesia

Year of Implementation: 2005

Background

The Indonesian coastal zone is rich in tropical marine ecosystems (such as estuarial beaches, mangroves, coral reefs, seagrass, algal beds and small island ecosystems) and also has an abundance of species diversity. Mangroves in Indonesia cover 30,000 km^2, account for 21% of the global mangrove area, and contain 39 species of the world's 75 species of true mangrove. As a result, protecting mangroves in Indonesia has significant meaning. Meanwhile, most of the Indonesian population, including various ethnic groups, culturally have lived in coastal zones.

Sivery lutung(*Trachypithecus cristatus*)

Community Mangrove Patroling Unit

The coastal life creatures and communities in Yagasu's program sites are in a vulnerable condition due to climate change and the rise in sea levels. The data series from Local Climate Institute was analyzed and showed that the air temperature, air humidity, precipitation, length of sun radiation and wind speed in the Northern Sumatra coast have significantly changed during the last 35 years.

The non-climate factors such as land use change and deforestation in Coastal Green Belt(CGB) have contributed to the significant loss of mangrove ecosystem over the past 30 years. Yagasu's GIS analysis showed the CGB mangrove cover in Aceh province, North Sumatra province and Riau province decreased 81%, 79% and 68% prospectively.

Indonesia is one of the developing countries that are most vulnerable to climate change because of having fewer social, technological and financial resources to adapt to the climate exposures. People living in vulnerable villages with constant threat of natural disasters now face increased severity and possibly increased frequency of these events with all associated risks to life and livelihoods. The climate disasters result in loss of thousands of human lives and destroyed settlements and farmlands--causing more loss of homes and jobs every year.

Yagasu has developed a long-term program "Coastal Carbon and Biodiversity Corridor(CCBC)" to strengthen costal management.

Main activities

The program sites stretch along 2.034 km and cross 28 districts/towns in Aceh, North Sumatra and Riau province of Sumatra Island. The program is scaled-up to link a CCBC of East Java-Bali-West

Nusa Tenggara and Est Nusa Tenggara coastlines.

The goal of program is to increase the management of coastal ecosystem for: ①biodiversity conservation; ②climate mitigation through carbon storage and sequestration; ③natural disaster prevention from sea level rise and unpredictable climate events; ④green economic development for community welfare. The long-term goal is to ensure the program contributes to Indonesia's coastal ecosystem's future ecological, social and economic development, and to the global green-house gas emission reduction.

Major activities include: ①conducting public engagement and awareness on biodiversity conservation; ②supporting local communities in restoring the degraded mangrove ecosystem; ③mobilizing Community Patrolling Unit(CPU) to protect existing mangroves; ④facilitating village government to set up Village Policy Initiatives(Village Land-use Plan – VLP, Mangrove Protected Area – MPA and Village Regulation -VR); ⑤supporting local communities and women groups on Income Generating Activities; ⑥conducting various scientific research [carbon accounting, economic valuation of the ecosystem, CCB (Climate, Community and Biodiversity) study and field assessment]; ⑦aligning with Indonesian national policies on CBD, NDC(Nationally Determined Contributions) and NPA (National Protected areas) .

Main outcomes

(1) Ecological value

After 16 years(2005—2021) of CCBC program and activities implementation and completion , ecological value products include the following:

Mengrove restoration in Northern Sumatra

①Sustainable mangrove management: 18,100 hm^2 of degraded mangroves have been restored, and 92,000 hm^2 of existing mangroves are now protected by local community groups. Restored mangroves contribute 724,000 CO_2 per year to global greenhouse gas emission reduction. CPU operations and local village policies on VLP, MPA and VR have successfully reduced the threats of illegal logging and land conversion to a level below 5%.

② Biodiversity Conservation. The stable condition of the mangrove ecosystem has been instrumental in conserving 23 species of mangroves, 8 species of mammals, 16 species of reptiles and amphibians, 32 species of invertebrates, 73 species of birds, 41 species fishes and 9 species migratory birds. Some flagship species such as dolphin, brahminy kite eagle and key species of migratory birds have returned due to the CCBC.

The ecosystem also supports commercial biodiversity: 7～12 t of crab, 3～5 t of shrimp and 500～700 t of fish per week for non-stop production through the year. The improve mangrove management in program areas has contributed 27.21% in percent increases to fishery resource production.

(2) Social-economic value

①Yagasu conducted over 2,000 villages and district meetings and provincial workshops to raise awareness of our program and build local, long-term commitment for it.

②Yagasu conducted 490 awareness and environmental education programs that reach 4,455 men and 6,345 women. The program had 32,400 local community participants(57% women and 43% men) .

③Yagasu signed long-term agreements with 235 village governments and 298 community groups, and with 15 government institutions at provincial and district level.

④ Yagasu conducted training and provided capital, equipment and materials for local communities to operate the village business for organic mangrove “batik”, mangrove eco-tourism, organic silvio-fishery, Nypa leaf business development, soft-crab farm, shrimp-paste production, mangrove food processing, dried/salted fish and other small village business.

⑤Average income of local community has increased 49% from 190 USD per family per month to 283 USD per family per month after 6 years program implementation.

About the applicant: Yagasu is an Indonesian social organization established on July 17, 2001. Yagasu was established to fulfil a unique role – providing innovative field actions and finance for long term program on: climate change mitigation and adaptation; species and forest conservation; facilitation of income generation for local communities on low-carbon economic.

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ARK's Voluntary Restricted Zones

Association of Responsible Krill Harvesting Companies

Approaches: Policy making and implementation; Sustainable use of biodiversity

Target: Ocean and coastal

Location: Western Antarctic Peninsula

Year of Implementation: 2018

Background

The Voluntary Restricted Zones(VRZs) represent the main conservation effort from Association of Responsible Krill harvesting Companies (ARK) companies to protect critical habitat for krill-dependent predators, mainly penguins, during the summer season. The principle is to protect key breeding colonies of Gentoo, Adélie and chinstrap penguins(*Pygoscelis papua*, *Pygoscelis adeliae*, *Pygoscelis antarcticus*) during their most critical period: incubation and chick-rearing.

As a precautionary action, the VRZ is a voluntary measure established by the industry, in consultation with several social organizations operating in the Southern Ocean. It was launched in July 2018 with support from Greenpeace, WWF and the Pew Charitable Trusts. It was proposed to improve the long-term sustainability of the krill fishery, to balance the rational use of the Antarctic krill, and the demands of natural predators during the most critical stage of their life history: reproduction.

Main activities

This voluntary measure protects the foraging ground of penguins breeding in the Western Antarctic Peninsula.

By precluding from fishing around these colonies during their more critical time of the year, ARK members are allowing for a successful nesting season for all the three penguin species nesting in the area of concern.

The VRZs protect breeding grounds of:

Hungry whales

About 50%-55% of the breeding population of Adelie penguins;

About 75% of the breeding population of chinstrap penguins, including large colonies (>10,000 pairs);

Almost all Gentoo penguin breeding colonies, including all colonies greater than 3,000 breeding pairs (about 52% of the population in the region) , in the Antarctic Peninsula area.

This measure also favors other predators such as the Antarctic fur seal and whales.

Main outcomes

This is a conservation measure in the Southern Ocean initiated and maintained by the fishing industry. Although similar regulatory measures had been tried elsewhere, none occur at this large spatial scale. At the same time, the inherent difficulties of bringing together more than 25 members within the Commission for the Conservation of Antarctic Marine Living Resources(CCAMLR) make this voluntary measure a win-win situation for conservation and the industry.

About the applicant: Association of Responsible Krill Harvesting Companies, ARK, brings together the krill fishing industry to foster the development of a sustainable fishery on Antarctic krill to coordinate and cooperate with the CCAMLR on the provision of research and information on krill and the krill fishery to support scientific research and educational initiatives of CCAMLR to manage the krill fishery on a sustainable basis.

“Panda Forest Honey” Boosts Rural Green Development in the Giant Panda National Park

Beijing Shanshui Partners Co., Ltd.

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Financial support mechanisms; Sustainable use of biodiversity; Development of rural green business capacity in nature reserves

Targets: Forest; Freshwater & wetland

Location: Four administrative villages in Sichuan, Shaanxi and Gansu provinces of Giant Panda National Park, China

Year of Implementation: 2011

Background

Establishing a sustainable community development mechanism and achieving a win-win situation for ecological conservation and local development are one of the important tasks in the establishment of Giant Panda National Park. However, the giant panda habitat faces the prominent conflict between community economic development and ecological protection. Among all the national parks in China, this national park has a large human population and is in a very complicated situation. There are many remote mountainous areas in the park, and the residents’ lives are closely related to wild animals. The current local industrial structure heavily relies on resource-consuming industries such as mining and water power. The traditional resource utilization methods that local residents rely on are strictly limited, including bamboo cutting, getting bamboo shoots, herbal medicine picking, and grazing. There are very few ways for the locals to be lifted out of poverty. Sixteen of the 30 counties (cities, districts) within the park were once “concentrated contiguous counties with special difficulties” and “national key poverty alleviation counties” in China.

At the community level, the reason why biodiversity advantage is difficult to translate into ecological value is that small farmers are scattered in production and management, and their ability and

resources are limited. The villagers' anti-risk ability is low, and it is difficult for them to join the community co-creation when the market prospect is uncertain. Therefore, villagers have never benefited from ecology and conservation, and their awareness, willingness and ability of conservation were uneven.

Main activities

In response to the above situation, Shanshui Partners focuses on the empowerment and linkage, improves the commercial capabilities of local cooperatives, establishes a mechanism for income feeding back to conservation, and encourages participatory protection actions, which form a virtuous circle of "good ecology—good products—good income—good communities—good conservation".

(1) Empowering "Forest Cooperatives"

Empowering business capabilities: natural resources and local community background investigation, product planning(panda forest honey, etc.) , quality improvement and qualification acquisition, advertising, sales planning, and sales resource connection.

Nurturing the team: the project organizes trips to learn and exchange, helps community establish management mechanisms, provides small supporting funds during the start-up period, and learns about the government and public welfare resources that match the direction of rural development.

Volunteers took group photos with beekeepers when harvesting honey at Baishuijiang, Gansu Province in August, 2016 (Wang Feixiang/Photographer)

During the summer visit of Baishuijiang, Gansu Province in June 2020, Yuan Guiping, Manager of Community Development Department of Shanshui Partners, and Zhou Chaoquan, Liu Xuepeng and Zhou Daiping, villagers of Shengou Village, discussed the work plan of the production team (Zheng Lan/Photographer)

(2) Accompanying "Good Forest Community"

Improving community governance capabilities. 10% of the project's sales revenue will be given back to the community in the form of Community Protection and Development Fund. The fund is managed by the villagers independently to improve the villagers' awareness, willingness, and ability to participate in community's public affairs and biodiversity conservation.

(3) Spreading the story of "Forest Kitchen"

Carrying out concept advocacy and brand publicity for the urban public and consumers, and telling the ecology, community, and ecological protection stories behind the local ecological products.

(4) Linking "Forest Charity"

Discovering the needs of the local community in public welfare and protection with nature reserves and communities and getting access to urban volunteer resources.

When the community builds teams, ecological products and feedback mechanisms, it is able to respond to broader policy, commercial, and public welfare resources, and develop in a virtuous circle.

Main outcomes

(1) Ecological value

The "Panda Forest Honey" project is rooted in four administrative villages in Sichuan, Shaanxi and Gansu provinces of Giant Panda National Park, and cooperates with villagers in patrol of 328 person-times/year, covering a patrol area of about 43.32 km^2, guarding 92 species of mammals, 4,175 species of flora and 248 species of avifauna.

(2) Social-economic value

①Development and value realization of ecological products. This project has formed an eco-friendly apis cerana farming standard and management system. As of June 2021, the accumulated purchases have helped the beekeepers reach RMB 2.79 million in income. The project has also donated RMB 516,000 to the community's Conservation and Development Fund and supported the green development of the community to have obtained RMB 274,000 for social welfare support.

②Supporting ecological conservation. The project has helped to incubate 2 conservation centers for villagers, and assisted in community ecological conservation actions to have obtained RMB 130,000 for public welfare funding.

③Urban public promotion. In 2020, the number of readers on WeChat and Weibo reached 83,346. Due to the pandemic, no public activities were carried out, and 304 hours of volunteer services were provided with reference to the data in 2019.

④Sales. The project cooperated with China Meheco International Co., Ltd., St. Regis, Ritz-Carlton, CreditEase Fortune, Huatai Securities and other high-quality enterprises to promote the Panda Forest Honey Project.

⑤Replication and promotion. Compiling the *Research Report on the Ecological-friendly Product Certification System of Giant Panda National Park* for the Giant Panda National Park(Sichuan) Administration.

(3) Innovation

①Cooperating with the nature reserve and empowering the forest cooperatives to enable the villagers to realize, and gain the ability to accomplish the translation of good ecology into good products and good income.

②Giving back 10% of the sales revenue to the "Community Protection and Development Fund", guiding the community to independently manage the fund in a fair, transparent and just manner. Assisting the community to identify community's needs and taking collective actions. Realizing development and ecological conservation together, and actively creating good forest villages full of happiness.

③Establishing a connection between urban and rural areas, and actively developing new products, for example, Shanshui annual gifts, moon cake gift boxes, etc., which enhance the added value of primary agricultural products. Using products as a medium to promote and advocate the concept of

Mr. Wang guides on the bee farm (Liang Yuan/Photographer)

"ecological justice", the project introduces the ecological conservation of nature reserve, and the production and life of villagers.

④After assisting the community to incubate initial products, teams, and collective action capabilities, the project uses the community as a platform to actively link the resources of the government, commercial and public welfare, and jointly support the community's green development and ecological protection actions.

About the applicant: Established in 2011, Beijing Shanshui Partners Co., Ltd. has devoted itself to empowering the rural green development of nature reserves for many years and is the first social enterprise certified by China Charity Fair in the field of ecological conservation in China. Shanshui Partners focuses on empowering the last and most beautiful nature reserve in China, linking the development needs of villages in nature reserves, with the resources of the government, enterprises and the public, developing high-quality ecological products and services, spreading the value of ecology and conservation, and exploring the possibility of stimulating the whole society to participate in sustainable ecological conservation by commercial means.

A Win-win Case of Coordinated Conservation and Development of Chaoyang Village Nature Reserve in Shaanxi

Chaoyang Village Zuoxi River Catchment Nature Conservation Center

Approach: In-situ conservation

Targets: Forest; Water; Flora; Mammals; Amphibians; Avifauna; Freshwater organisms

Location: Chaoyang Village, Shaanxi Province, China

Year of Implementation: 2017

Background

Located in Maoping Township, Yangxian County, Shaanxi Province, Chaoyang Village is close to the core area and experimental area of Shaanxi Changqing National Nature Reserve.Local residents used to rely on agriculture as their main source of income. With the implementation of the national policy of returning farmland to forests, the area of cultivated land has decreased. At the same time, due to the high market price of exotic animals, many local villagers began to place hunting traps on the mountains to hunt wild boars for money, while hunting traps often catch other wild animals. In addition, in order to catch wild Chinese giant salamanders (*Andrias davidianus*) , many villagers unrestrainedly poisoned fish, resulting in a sharp drop in the number of giant salamanders and other fish and frogs in the river. With the improvement and implementation of the national conservation polices, poaching activities in the village began to decrease. The villagers have realized the importance of the ecological environment and independently established a conservation center in 2017 for the purpose of nature protection.

Main activities

①Carrying out habitat conservation. The local community in Chaoyang Village stopped retaliatory hunting of wild animals in the autumn harvest season; in addition to maintaining the original

When the Conservation Center has been established for a short time, electrofishing was still a very serious issue, so the patrol team members write the slogan "No Fishing" along the river every quarter

nature reserve, the Conservation Center signed a conservation agreement with the 9 groups of Chaoyang Village, which expanded the conservation scope, river course and patrol team by 800 mu, 5 km, and 4 members respectively, and continuously expanded the nature reserve; the community's awareness of conservation is increasing, and the subjective awareness of resource management is obvious; the Conservation Center and Changqing National Nature Reserve carried out joint forest fire prevention actions and signed *the Agreement on Joint Forest Fire Prevention and Wildlife Conservation*; with the support of Zhang Lu, a teacher from Sun Yat-sen University, and Beijing Qingye Ecology, 16 giant salamanders were released in Chaoyang Village, and the species restoration and behavior research of wild giant salamanders were carried out.

The villagers who worked outside the hometown returned to the village and actively participated in the patrol, during which their shoes were wet with snow and they were warming themselves by fire

②Developing green industry and conducting Asian honey bee(*Apis cerana*) farming. Beekeeping is one of the important traditional livelihoods for farmers in Chaoyang Village. At present, a certain scale and a market brand have been formed, laying the foundation for realizing the conservation and sustainable development of Asian honey bees. To date, Chaoyang Village boasts 200 beekeeper households accounting for more than 60% of the households in the village. The beekeeper households boast about 5,000 boxes of bee species, with an annual output of 15,000 kg honey(about 3 kg/box) and with an average annual income of about RMB 10,000 per household.

Ten beekeeper households in Chaoyang Village have cooperated with Beijing Shanshui Partners Co., Ltd. (hereinafter, "Shanshui Partner") for 6 consecutive years. Chaoyang Village is one of the producing areas of "Panda Forest Honey". Shanshui Partners encourages local villagers to participate in forest conservation and improves collective action of communities through at least 20% purchase premium, purchase of all qualified honey, and at least 10% income feedback.

Villagers are collecting a newly separated bees colony on tall trees

③Carrying out nature education activities. Since 2019, based on its rich natural resources and Asian honey bee industry, the Conservation Center has cooperated with various institutions to carry out nature education activities. Nature education courses include introduction to Asian honey bee, patrol experience, nature observation and so on. At present, the nature education activities in Chaoyang Village are still in infancy, but expected to bring continuous resources support and protection to the community.

Main outcomes

(1) Ecological value

Change of the state of targets: Through protection and development, the sharp-snouted lenok(*Brachymystax lenoks*) fish have been effectively restored, the aquatic organisms in the river have increased, and the otters(*Lutra lutra*) have returned to Zuoxi River Basin; the activity range of wild giant pandas continues to spread; traces of golden snub-nose monkeys and takin(*Budorcas bedfordi)*, etc. have increased significantly; the number of Chinese muntjacs in the forest has increased.

Reduction of key threats: According to the feedback from Changqing Nature Reserve, there have been no forest administration cases such as poaching and illegal logging in Chaoyang Village since the establishment of the nature reserve, and the number of forest administration cases in Chaoyang Village has dropped to 0.

(2) Innovation

Zuoxi River Basin Nature Conservation Center in Chaoyang Village fills the gap of social welfare organizations in Yangxian County, which is a beneficial attempt to innovate the conservation mechanism and improve the existing nature reserve system.

About the applicant: Established in 2017, Chaoyang Village Zuoxi River Catchment Nature Conservation Center is located in Yangxian County, Shaanxi Province. The conservation scope mainly covers the forest land and river course of Group 13 of Chaoyang Village. In March 2019, some forest land of Group 9 of Chaoyang Village was included in the scope, making a total conservation area of 6525 mu. The Conservation Center targets at giant pandas, takins, Sichuan snub-nose monkeys, crested ibis, forest musk deer and *Brachymystax lenoks*, and carries out daily course conservation and development such as patrol conservation, scientific research monitoring, river restoration, background investigation, nature education and Asian honey bee conservation, so as to drive local community residents to participate in the management and conservation of giant panda habitats.

12-year Practice and Exploration of Conservation and Sustainable Development in Guanba Village, the Hometown of Panda

Guanba Watershed Conservation Center in Pingwu County

Approaches: In-situ conservation; Sustainable use of biodiversity

Target: Forest

Location: Guanba Village, Sichuan Province, China

Year of Implementation: 2009

Background

Guanba Village is located in Pingwu County, Sichuan Province, which has the largest number of wild giant pandas, and is adjacent to Tangjiahe National Nature Reserve to its east, Old creek Nature Reserve to its north and Yujiashan Nature Reserve to its south. It is not only the habitat of giant pandas, but also the corridor of these nature reserves. Historically, the local Baima people called the area centering on Guanba the Great Tribe of the White Bear (the local name for the giant panda), advocating its once large numbers of giant pandas and the banlanced relation between human and panda.

With economic development, the expansion of human settlements and loss of wildlife habitats have occurred worldwide, and the ancient “reliance on mountain resources for survival” has evolved into reliance on mountain resources for money. In less than two decades(from 1980s and 1990s) , the green hills becoming bare with trees cut down to bare hills, and rampant floods occur from time to time. The number of wildlives has declined sharply, with large carnivores at the top of the food chain such as wolves and tigers in extinction, and the number of pandas, affected by habitat destruction, has not escaped the fate of continuous decline.

Things began to change in 2009.

Main activities

In 2009, Shan Shui Conservation Center, through field research, started to use the "alternative livelihood" approach to begin the ecological conservation of Guanba Village. Gradually, the internal power of industrial transformation has been developed within the village itself. In 2009, Guanba Village raised about 1,000 sheep, 100 cattle and 100 boxes of bees. Since 2013, beekeeping in Guanba has increased to about 1,000 boxes, sheep farming has decreased to only two households with around 100 sheep, and there are fewer than 10 cattle; Some young people began to return home, and their return ensured the endogenous driving force for the sustainable development of Guanba.

Subsequently, the conservation reached from the cooperative to the village committees, and in 2016 the conservation center was established, and Guanba became the first community nature reserve in Sichuan Province, while the village also set up corresponding cooperatives to work on walnut, eco-tourism and other industries.

In 2017 the Guanba Watershed Nature Reserve and the neighboring conservation entity, Old Creek, started the first joint patrol for anti-poaching to fill in management gap in borderline areas. Today, this activity has developed into a large-scale joint anti-poaching action involving three counties of two provinces in the Minshan Mountain region, and the participating entities include national, provincial, and county nature reserves as well as the village nature reserves around Guanba.

In 2018, Guanba became the first public welfare nature reserve listed by the "Ant Forest" as "no need of tree planting". As the conservation achievements were recognized, Guanba began to think about how it can benefit from conservation - exploring nature education and beginning to practice it.

Main outcomes

(1) Ecological value

①Ecology improves and animals return. Guanba established a patrol group for conservation in 2009. From 2009 to 2013, the infrared camera did not capture images of large mammals. 2014 saw the capture of images of pandas, black bears, snub-nose monkeys, and other large mammals, and in the same year, part of the benefits of beekeeping was used to buy native fish fry for proliferation and releasing. The protection is extending from the mountains and forests to the waters. In 2017 the fish fry that had not been seen for more than 10 years started to appear, in 2019 the infrared camera photographed the return of otters, and in 2021, the infrared camera captured wild mammals such as Asian golden cats(*Catopuma temminckii*) and macaques(*Macaca mulatta*) that have not been recorded in the past two decades. The gradual recovery of Chinese medicinal materials such as Chonglou and tianma is seen during the patrolling of the mountains. 67 mu of giant panda habitat has been restored. Panda's activity traces also became closer to the village.

Giant panda photographed by infrared camera

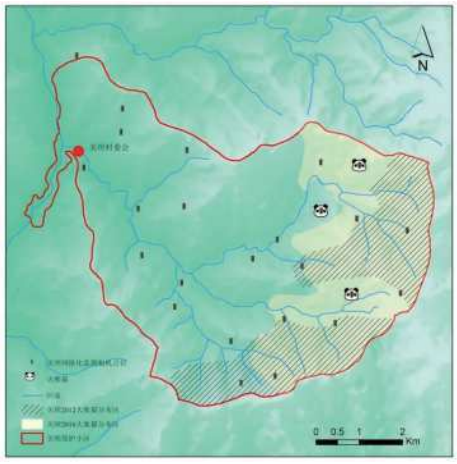
②Clean energy replaces firewood. Solar energy used to replace firewood can provide more than 1/3 of the daily energy required by each villager's family. This alone can reduce 55,000 m^3 of firewood logging every year, reduce soil erosion and increase carbon sinks, and ensure the drinking water safety of more than 600 people in Guanba Village and Mupi Tibetan Township.

(2) Social-economic value

After Guanba became a nature reserve, its influence and reputation were improved.

In 2018, Guanba became an Ant Forest nature reserve, with over 13 million netizens contributing to it. With the endorsement of Guanba story, the ecological poverty alleviation case of Ant Financial Services and Pingwu County achieved the records of selling 10,000 bottles of honey in one hour for the first time; 10,000 bottles in one minute for the second time; and 10,000 bottles in one minute pre-sale for the third time.

18 nature education activities have been conducted in Guanba Village so far in 2018, and the cumulative number of participants has reached more than 500, contributing an income of about RMB 260,000.



Trace change of panda location in Guanba Village

The neighboring communities of Guanba Village in Pingwu County have followed Guanba's conservation model. As of 2021, 6 village-level autonomous community reserves have been established and operating in Pingwu County, not including Guanba.

The cooperatives in Guanba Village also brought increasing profit and dividends to the villagers.

(3) Innovation

Most of the conservation is operated and promoted in a project-based manner. This is reasonable in some ways, but there is no one-size-fits-all system, especially for the villages around nature reserves. Many organizations have come to work on conservation here, but few of them were sustainable. The innovation and sustainability of the Guanba case lie in three aspects.

People: The ability training and burden-bearing of local people are solid. Villagers start to grow strong, they talk and negotiate with the outside world on an equal footing, discuss and coordinate. At the same time, the participation and recognition of the vast majority of people in the village affairs are the key to success.

Initiative: All things must go through village discussion, rather than boosted by the external forces or promoted as needed by the projects.

Money: In line with the market principle, the distribution of profit works in a "more work, more money" principle, while considering the special characteristics of the village, a proportion of universal benefits are taken into account.

About the applicant: Guanba Watershed Nature Conservation Center was established in 2016 as a villagers' self-governing institution. In 2009, Guanba Village began to develop environment-friendly industries for conservation with the support of Beijing Shan Shui Conservation Center. In 2016, Guanba Watershed Nature Reserve in Pingwu County was formally established. The nature reserve takes Guanba community as the main body to carry out biodiversity conservation in the whole region, shelve forest right disputes and integrate resources. In 2018, it became a public welfare nature reserve of "Ant Forest".

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Angsai Nature Watch Eco-tourism Pilot Project

Poverty Alleviation Ecotourism Cooperative in Niandu Village, Angsai Township, Zaduo County

Approach: In-situ conservation

Target: Mammals

Location: Ansai Township, Yushu Tibetan Autonomous Prefecture, Qinghai Province, China

Year of Implementation: 2018

Background

Angsai Township is located in the core conservation area of the Lancang River Source Park(LRSP), Three-River-Source National Park (TNR). It is rich in natural resources and has large carnivores like snow leopards, common leopards, and Tibetan brown bears, as well as birds and herbivores like blue sheep, white-lipped deer and musk deer. It is also one of the important habitats of snow leopards. 80 snow leopards and 12 leopards have been identified through monitoring data analysis. This is the first time that the habitat overlap of common leopards and snow leopards was discovered in China.

In 2018, under the authorization of Angsai Management and Protection Station of LRSP, Angsai Nature watch Eco-tourism Pilot Project was launched. In this project, herders act as nature watch guides, drivers, and host families, leading nature watch participants to observe natural and cultural landscapes and experience pastoral life in Angsai Township. The project aims to assist participants to share the unique nature of Sanjiangyuan and raise the awareness of nature respect and protection. The project integrates natural protection with social development so that local herders can earn income, and intuitively realize that protecting the landscape in their hometown and caring for wild animals on the mountains will benefit the development of families and communities.

Main activities

①Beginning in 2018, the cooperative has cooperated with Shan Shui Conservation Center to carry

At the community meeting, everyone discussed nature watch routes together (Li Yuhan /Photographer)

A herder guide learning to use telescopes and other equipment (Li Yuhan/ Photographer)

out 5 sessions of comprehensive guides' training for the 21 nature watch host families selected, provide a community management system, as well as offer project products including a distribution map of wildlife resources, and information on nature watch host families, and created the website: "valleyofthecats.org.cn" for the promotion and reservation of Angsai Nature watch Eco-tourism Pilot Project.

②In March 2019, after the initial pilot phase, this project was approved by TNR Administration and awarded the first-ever community-based wildlife-observing tourism franchise inside a national park in China. In the same year, four community members were elected as coordinators to form corporative management team coordinating and supervising nature watch activities.

③Since the end of 2018, the project has adopted a benefit distribution system in the community. The total revenue is distributed as follows: 45% to the host family, 45% to a community fund, and 10% to community-based conservation projects within Angsai.

Main outcomes

(1) Ecological value

This project enhances the ability of community residents to participate in conservation. Data collected on wildlife observed during the nature watch activities is beneficial to the further research on and analysis of the ecosystem. By increasing community income to encourage local people to participate in long-term conservation, the project directly links flagship species such as snow leopards with benefits, changing herders' attitudes towards these species and increasing conservation awareness and participation.

(2) Social-economic value

From 2018 to the end of 2020, Angsai Township has hosted 133 nature watch teams from all over the world, with a total of 408 person-times. In addition, the project brought a total income of more than 1.36 million yuan to the community, including community public fund of more than 480,000 yuan.

Fully empowering the community. From the design of nature watch route to the discussion of management system, the project has effectively improved the self-organization and management ability of the community, and boosted the efficiency of solving various problems in the experience process.

Guides and visitors wait for wild animals to appear at observation points (Zeng Zhang/Photographer)

(3) Innovation

This project is one of the first batch of community-based eco-tourism pilot projects in China to obtain national park franchise rights. It is based entirely on local herder cooperatives. Shan Shui and the local government provides technical and financial support respectively. There is no interference from external economies, and all profits remain in the local community, which really benefits the latter. At the same time, the project will cooperate directly with national parks to discuss the franchise system under the national park system.

About the applicant: The poverty alleviation eco-tourism cooperative in Niandu Village, Ansai Township, Zaduo County was established in 2017. Its business scope includes production and sales of livestock products, folk culture, tourism reception, accommodation and catering. At present, it is responsible for the operation of Angsai Nature Watch Eco-tourism Pilot Project, which is also the first pilot project of ecological experience franchise in national parks in China.

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Community Marine Conservation and Restoration

Community of Arran Seabed Trust

Approaches: In-situ conservation; Legal approach; Public participation; Publicity & advocacy; Sustainable use of biodiversity;Traditional knowledge

Target: ocean and coastal;

Location: Isle of Arran, Scotland

Year of Implementation: 1995

Background

The Firth of Clyde, on the west Coast of Scotland, was once one of the most productive fishing grounds in Europe. However, successive decades of poor management and overfishing led to a dramatic loss of biodiversity and the collapse of finfish fisheries.

In response, concerned local residents on the Isle of Arran, which lies in the middle of the Clyde, formed the Community of Arran Seabed Trust (COAST) in 1995. This grassroots initiative has mobilised local communities and built strong links with a range of other sectors to campaign for better marine management, initially in the locality of Arran, and subsequently across Scotland. COAST provides an important model not only for science-based and effective marine management, but also for communities taking a stand for local marine health.

Main activities

(1) COAST achieved the establishment of Scotland's first and only community led no-take zone (NTZ) , and led a process to develop participatory plans for, and improve management of, a larger marine protected areas around the island of Arran

COAST has always had a strong foundation in biological and ecological information. The data generated through citizen science and academic studies over the years has been key to empowering COAST and the Arran community to call for the establishment of the NTZ and the Marine Protected Area

(MPA) and fisheries management measures.

After 13 years' campaigning, a small(2.67 km²) area in Lamlash Bay became Scotland's first NTZ in 2008. This remains the only NTZ in Scotland and one of only four highly protected marine areas in the UK.

Community celebrate the MPA

Further lobbying by COAST led to the 2014 designation of a much larger MPA around the southern half of Arran which also encompasses the NTZ. Continued lobbying by COAST led to much of the South Arran MPA being protected from certain fisheries impacts in 2016. These fisheries management measures prohibit scallop dredging across the whole of the MPA, and trawling in all but three outer areas(which permit demersal prawn trawling) . In addition, passive fishing gear(including nets, pots and lines) is prohibited in four areas to protect particularly sensitive habitats. Evidence of seabed recovery from Lamlash Bay has supported the development of stronger protection for Scotland's MPAs.

(2) COAST partnered with other sectors to develop scientific basis

Ecological change in response to spatial protection(zones where dredging and trawling are prohibited) is not yet fully understood in UK temperate marine systems because there are very few sites with such protection from mobile bottom fishing gear where research started promptly and is ongoing following protection measures being put in place. COAST put some efforts into this. In 2010—2020, they partnered with York University to understand how spatial protection helps restore and protect fish and shellfish populations through all stages of their life cycle.

A complementary area of research with the University of Glasgow has looked at how the relative complexity of seabed habitat affects its suitability for different fish, including commercially important species such as Atlantic cod, haddock and whiting. The work shows that the seabed landscape is likely to influence the potential for recovering fish stocks, and thus the greater complexity of the MPA has potential to help correct any imbalances in the longer term.

Without the evidence generated by these projects there is no informed basis on which to make management decisions about the MPA in terms of future management of the fisheries within the MPA and further afield, and to ensure recovery and sustainable management of commercially important

species.

(3) COAST's conservation success has inspired other local communities around the UK, and further afield, to take the destiny of their coastal waters into their own hands

COAST joined force with Fauna and Flora International to establish a network for other communities, looking to learn from COAST and emulate their efforts to protect local marine sites from destruction and damage. This network (the Coastal Communities Network) now has 18 active community groups, all following in COAST's footsteps. COAST has also become a respected voice on marine issues not only in Scotland, but worldwide, and one of its founders was awarded the prestigious Goldman Prize in 2015.

Main outcomes

(1) Ecological value

2019 data shows a 3.7-fold increase in king scallops(*Pecten maximus*) density within the Arran NTZ since 2010. Outside the NTZ in the wider MPA(where scallop diving is allowed) there has been more than a 6-fold increase in density since scallop dredging was prohibited in 2016, suggesting both the benefits of protection and a "spill-over" of scallops from the NTZ.

In a similar trend to the scallops, the European lobster(*Homarus gammarus*) is also showing a significant increase in numbers in the NTZ with the catch rate of legal sized lobsters being over 4 times higher in the NTZ than in adjacent areas, and they are larger and producing more eggs.

(2) Social-economic value

①Public education. COAST established a marine discovery centre，empowered its own community and others around Scotland to have the confidence and skills to tackle threats to their own marine environments and to their livelihoods. Marine Discovery Centre connects people with the hidden marine world around Arran and further afield in Scotland. There is also a wide-ranging awareness raising programme that includes activities and events for residents and island visitors as well as visits from school groups and Arran Outdoor Education Centre groups.

Lobster

②Voices. COAST has brokered relationships with a range of sectors, and has been able to communicate ideas communities direct to planners and policy makers in a

way that has not happened before for the marine environment in Scotland. As a leader of the Coastal Communities Network, COAST has helped other communities find their voice, and created a platform where these voices can be aligned to have a real impact on policy.

COAST Discovery Centre

③Ensure Livelihoods. COAST has also worked to ensure that local communities can better benefit from the healthy oceans they live besides, by mobilizing new sources of livelihoods, building on the pride fostered around locally-driven marine protected areas.

(3) Innovation

This grassroots initiative has been truly ground-breaking. Not only did it achieve the only no-take zone in Scotland—but also the South Arran MPA and the only model for effective community management of a marine protected area in the UK. This inspired many other communities to engage in marine conservation and to take action.

About the applicant: The Community of Arran Seabed Trust(COAST) is a community-led marine conservation charity on the Isle of Arran, Scotland. We were established in 1995 with the aim of securing protection and better management for the coast and seas around Arran in the face of a catastrophic collapse of fisheries in our local waters and unchecked damage to seabed habitats from bottom trawl and dredge fishing. COAST has been successful in establishing the first marine No Take Zone(NTZ) in Scotland in 2008(the first community-led NTZ in the UK) and achieving the statutory designation of the 280 km^2 South Arran Marine Protected Area(MPA) . COAST campaigns for policy change and action to recover Arran and Scotland's seas and have outreach, communications, survey and research programmes to support this.

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Locally Managed Marine Areas in the Western Indian Ocean

CORDIO East Africa

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Policy-making and implementation; Financial support mechanisms; Traditional knowledge

Target: Marine creatures

Location: Western Indian Ocean

Year of Implementation: 1999

Background

Both many livelihoods and the global economy are a reliant on the sea, a fact that people are more conscious of now as there is increasing pressure on land. In1998, a widespread global coral bleaching event occurred during El Niño. CORDIO was established in the following year and started working on the conservation and management of coral reefs in East Africa and the wider WIO(Western Indian Ocean) region.

Since the establishment of a No-Take Zone(NTZ) by Kuruwitu Conservation and Welfare Community Based Organization(KCW CBO) in 2006, there have been improvements for the community and the marine ecosystem. While significant, these improvements have been gradual and are reflective of the difficulties in incentivizing the restoration of marine ecosystems which require long term interventions for crucial efforts to materialize into tangible progress.

Main activities

In the last 15 years, supported by many organizations and Kenya's Fisheries Department, CORDIO's efforts to scale up from the initial 29 hm^2 NTZ set by KCW CBO have been successful. CORDIO has focused on supporting capacity development, multi-level network building among community-based groups into local, sub-national and national fora, ecosystem approaches to fisheries,

and embedding responses to climate change vulnerability for resilience. Scaling up also ensures sustainable fishing that fosters controlled catches and coral reef health. Participatory research has been conducted to improve fishing methods for sustainability and climate resilience, and build learning networks for knowledge exchange.

Some of the key impacts of CBNRM include improved fishery and tourism income, and coral reef health; greater community resilience due to improved social and economic assets; and a shift from community stakeholders to "shareholders" who are able to derive primary assets and greater economic value from their fisheries.

Success factors have included co-management legislation and fisheries policy, for which government buy in and support are essential. Local ownership, facilitated by leadership and dialogue, has also been effective towards successful outcomes, and to long-term commitment. Sustainable revenue from primary assets have given communities greater incentive towards marine conservation as it enhances their livelihoods as well. Securing the initial capital investment needed to make the initiative viable was also essential, given that inadequate capital can be prohibitive to the off-take of small-scale projects of this kind. Finally, external interest from other communities and the recognition entailed in being a "flagship" that can lead to scalable impact across small scale fisheries in Africa.

Participatory research with wide-mesh basket traps to promote sustainable fishing

Fish catch monitoring by Beach Management Unit members

Main outcomes

(1) Ecological value

①Spillover of fish from the NTZs into the fished areas, improving fish populations overall and consequently improving livelihoods.

②Recovery(at least partial) of the coral reef fishery.

③Restoration of biodiversity and reef health in protection and management zones, and including of peripheral areas.

(2) Social-economic value

①Reduced dependence on subsistence fishing.

②Promoted learning of community-based marine resource management for other coastal areas; attracts other collaborators and partners such as civil society and government institutions to learn about the marine initiative.

③Promoted additional welfare and community support projects, improving community access to clean water, education and health facilities.

④Increased revenue through alternative income generating enterprises and training, took pressure off marine resources(for example, fish selling/marketing, farming, tourism, locally made products and outlets) .

⑤Initiation of related projects like aquaculture and coral restoration.

⑥Potential for community loan scheme, potentially including dividend schemes from a percentage of profits from enterprise.

⑦Promotion of income generating Women's groups.

⑧A change in gender attitudes in the community, such as a gender-balanced board, which is reported as having a broader significant impact.

(3) Innovation

①Devolution of management responsibilities from government to civil society, improving democratic and civil engagement. Providing opportunities for building capacity in community institutions.

②Creation of opportunities for improving value chains in market centers(for example, nearby town Mombasa, Nairobi) who pay higher prices for fish caught sustainably.

③Creation of a solid foundation following an ecosystem-based approach using CORDIO's 4 pillars(ecological, economic, social, governance) has led to the creation of the Co-managed area.

Training and sensitization exercise with community women's group

About the applicant: CORDIO East Africa was established in 1999 as a regional research network in the Western Indian Ocean(WIO) focused on coral reef science. Its formation was originally spurred by the global coral bleaching event of 1998. Formally established as a non-profit organization in Kenya in 2003, CORDIO has grown over the past two decades into a leading centre for coastal marine and ocean science and conservation in East Africa and the wider WIO region.

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Sustainable Livelihood Development for the Poor Communities in the Buffer Zone of a Provincial Protection Forest

Lao Biodiversity Association (LBA)

Approaches: In-situ conservation; Public participation; Traditional knowledge

Targets: Forest; Flora; Mammals; Amphibians; Avifauna

Location: Laos

Year of Implementation: 2017

Background

The provincial conservation forest in this project is a district conservation forest located in Pongsaly Province (northern part of Laos). There are more than 70 tree species such as *Hopea odorata, Hopea ferrea and Pterocarpus macrocarpus* found in the area. This area also has several endangered animal species including black bears, wild goats and pangolins.

In this district, there are 79 villages with 10 ethnic groups. Around 8 villages, 240 households, and in total, up to 1,148 women and 1,150 men participated in this project.

Main activities

Lao Biodiversity Association (LBA) believes in the promotion of forest and wildlife conservation，and initiated this sustainable livelihood development project in 2017. The project combines sustainable livelihoods and conservation through the promotion of cardamom growing and the production of bamboo furniture. It allowed local communities to generate sustainable income so they could stop relying so heavily on collecting forest products.

This project was funded by Bread for the World who gave regular advice on management techniques, and implemented in cooperation with village and district authorities.

District authorities provide technical support to the villagers such as forest law, techniques of

crop growing. Villagers facilitated the project and made sure it followed forest and conservation regulations.

For forest and wildlife conservation, LBA supported local communities to make forest management regulations such as patrolling plans and restoration strategies in each village.

LBA and village forest committee conducted forest patrol at conservation forest

Main outcomes

(1)Ecological value

This project helped to enhance the conservation of the conservation forest area for 23,635.88 hm^2 of highland forest evergreen, and semi evergreen. Illegal hunting and selling of 15 wild animals were regularly found by the patrolling team from the district agriculture and forestry office.

(2) Social-economic value

① The LBA promotes techniques for the cultivation, care-taking and harvesting of cardamom, tea and bamboo (for bamboo shoots) to improve productivity and increase income for local people.

LBA and village forest committee conducted patrolling at village conservation forest

The LBA cooperated with the District of Industry and Commerce Office to produce bamboo furniture in one village as the One District One Product. This bamboo furniture is sold in the district, in the province and is also exported to the Chinese market. LBA also provided saplings, planting techniques and access to the market of cardamom for 185 households in 6 target villages and increased local families' income from LAK 30,000 per kilogram to LAK 50,000 with an average income from cardamom of LAK 20,000,000 per year.

②The project allowed for the study of rare wild vegetables and red mushrooms which have nutrition and medicinal value and encouraged people to plant/grow them in home gardens for food security and conservation of wild vegetables.

About the applicant: The Lao Biodiversity Association abbreviated "LBA" is a non-profit association of technicians and protectors of biodiversity and the environment. This organization contributes to the dissemination and the implementation of state policies. To date, the LBA has been able to reach more than 6,000 people(particularly, ethnic minorities living in remote areas in Lao PDR).

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Trella 100 Million Tree Initiative

Trella Urban Forestry Technology, LLC

Approach: Public participation

Targets: Forest; Urban; Mountain; Arid and semi-arid area

Location: Jilin Province, China

Year of Implementation: 2021

Background

To support a cleaner, healthier climate in China and globally, Trella will plant 100 million trees in China, beginning in the northeastern province of Jilin. Trella is partnered with the Forestry Bureau of Fusong County in Jilin Province to launch this ambitious project. From Jilin, Trella will expand the project to additional provinces, planting native species suited for the local climates.

Main activities

Trella contributes to the biodiversity of the local forest and population during reforestation.

Reforestation with native-only, site-adapted tree species used in mixed species forests, trees used on the project are local-native, grown from seed, used in mixed stands, and planted to match site requirements. Sites are planted with both conifer and deciduous species mixes to ensure a healthier soil ecosystem, microbiome of the root, mycorrhizae diversity and health, resulting in stronger, healthier, more resilient growth and increased site carbon sequestration.

Forest management methods favor development of a robust and diverse layer of small non-tree species to maximize forest resiliency, species diversity, and carbon sequestration. Forests growing with many species are healthier because diverse species support greater numbers of soil dwelling species such as mycorrhizae, which help capture and distribute nitrogen to the trees.

Measurement of project site condition prior to planting to support a “do no damage” policy to the existing forest, as well as the design of a robust planted forest restoration. Trees planted in restoration

are all native to the area. Population density is managed for long-term survival and to follow the natural transition from pioneer species to late successional species over the course of decades. A self-replicating forest will result. The forest will not be harvested and will support an agroforestry system of Traditional Chinese Medicine.

Main outcomes

(1) Ecological value

Existing natural stand forests are supported through local-native planted forests. The soil ecology of the restored sites will more closely match that of natural forests than other agricultural systems. Greater numbers will live in the restored forest soil in greater volumes. Restored forests, with healthier soils, will sequester more carbon than single species plantation forests.

①Seed-grown, local-native tree species are used. These trees support populations of native shrubs and small plants which in turn feed native insects and small animals. This cycle, supported by a healthy forest, supports the larger fauna of the southern Jilin's Changbai area, such as Eurasian lynx, Siberian tigers, and various species of bears.

Trella Super Center, Taizhou China *Carpinus henryana* seedling, Trella's state-of-the-art greenhouse in China is capable of growing more than 1 million trees per year

Trella-certified nurseries

②Managed to move the forest through its stages of succession, these trees are planted in mixed species stands, with TCM and diverse shrub and forb species growing in the sublayer.

(2) Social-economic value

①Through science and research, grassroots community engagement and international governmental recognition, Trella has successfully built the capacity, and trust necessary to execute this initiative.

②Support local communities and farmers by creating jobs, providing education and training, and promoting eco-tourism.

For Earth Day 2021, SAP contracted Trella to plant more than 1,000 native Chinese trees in recognition of the Second Affiliated High School of Shanghai Normal University

(3) Innovation

Trella's reforestation project is supported with its proprietary inventory management systems(TIMS) , measuring growth and carbon sequestration.

About the applicant: Trella Urban Forestry Technology is a U.S.-based, China-operated nature-based solutions company growing and providing tree-based solutions to meet China's fast-growing environmental initiatives and needs. Investing in nature through science, consumers, enterprises, education, local and international social organizations through cooperation and in partnerships, Trella aims to increase economic, environmental, and social benefits to local, national and global communities.

Pingwu County, Sichuan Province—Using Biological Resources to Drive Ecological Poverty Alleviation

Chinese Research Academy of Environmental Sciences

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Policy-making & implementation; Financial support mechanisms; Sustainable use of biodiversity Access and benefit-sharing of genetic resources

Targets: Forest; Floras; Genetic diversity

Location: Pingwu County, Sichuan Province, China

Year of Implementation: 2014

Background

Pingwu County is located in the northwestern part of the Sichuan Basin and belongs to Mianyang City, Sichuan Province. It is located in the upper reaches of the Fujiang River and is extremely rich in forest resources, with a forest coverage rate of 74.58%. It is a part of Sichuan-Yunnan Forest and Biodiversity Ecological Function Area, and is an important ecological barrier area in the upper reaches of the Yangtze River. Pingwu County is also rich in biological resources. It is located in the priority area for biodiversity conservation in the northern section of Minshan-Hengduan Mountains. It is one of the top 25 biodiversity hotspots in the world. The county has two national nature reserves, Wanglang and Xuebaoding, as well as the Xiaohegou provincial nature reserve and three other types of nature reserves. The total area of the reserves is 1,460 km^2, accounting for 24% of the county's total area. The county covers an area of 5,950 km^2, governs 6 towns, 14 townships.

Pingwu County is a large and continuous area of severe poverty in the the Qinling and Daba Mountains, the extremely hard-hit area in the "May 12th" Wenchuan earthquake. It is also a minority ethnic area, a remote mountainous area and national key ecological function area. As a result of mutual effects of factors such as remoteness, frequent natural disasters, and lagging development, Pingwu County has been facing special difficulties such as poor infrastructure, slow industrial development,

weak livelihood guarantee, and limited income-increasing channels. It is a typical poor county with many disasters, poor conditions, a weak foundation, and underdevelopment. In July 2011, it was included in the key counties for poverty alleviation and development program in the large and continuous extremely poor area in the Qinba Mountain.

Main activities

Based on the high proportion of its nature reserves, Pingwu County actively innovated green development approaches, pooled multiple efforts, and cooperated with Sichuan Nature Conservancy Fund and Alibaba to explore an ecological public welfare poverty alleviation model. At the same time, relying on the advantages of giant pandas, Pingwu County built its brands, and developed ecological products such as panda honey to increase farmers' incomes. It has also built a panda town with folk custom features, which promoted tourism-based economic development and achieved a win-win situation between biodiversity conservation and green development, leading local people on the road to poverty alleviation.

Main outcomes

(1) Ecological value

In terms of biodiversity conservation, bee-keeping is used to force herbicides, fertilizers, chemical pesticides, etc. out of agricultural production and non-point source pollution is curbed in rural areas. Taking the Guanba Nature Reserve as an example. After the implementation of the project, the number of rare mammals such as golden snub-nosed monkeys and takins has increased significantly, indicating a richer biodiversity. The number of cattle and sheep has dropped by 83%, and environmental quality and ecological functions have been improved. Through e-commerce platforms and other new technologies in the Internet era, the public can access the products and learn about the natural resources in Pingwu, so that every consumer has the opportunity to participate in ecological governance and conservation, thereby improving the effectiveness of ecological conservation. The development of eco-agriculture and eco-tourism mitigates the interference of economic activities on the ecological environment. In particular, the "Pingwu Asian Honey Bee+" poverty alleviation model can not only effectively utilize the natural resources in the nature reserve, but also promote the seed plant species diversity in the natural ecosystem, the protection of rare vegetation, the maintenance of ecological balance, and the recovery of ecosystem.

(2) Social-economic value

Pingwu County has been awarded as a "County with Advanced Economy" at Sichuan County Economic Conference for 6 consecutive years and successfully transformed from a poverty-stricken county to a green development model county. People's income has greatly increased. 113 households in the surrounding communities of Old Creek Nature Conservation Center participated in contract farming, and the average income of farmers increased by more than 7,000 yuan. After the

implementation of the "Pingwu Asian Honey Bee+" ecological industry project, it has effectively driven the average income of poor households to increase by 8,000 yuan, and the collective economy of poor villages has increased by more than 10,000 yuan per year. The supporting planting of 20,000 mu of herbaceous honey plants and 40,000 mu of *Idesia polycarpa* var. *vestita* will form a stable source of income for the poor and promote the sustainable income growth for poor households. While driving the comprehensive development of rural communities and helping poverty-stricken areas to increase incomes, it also improves the overall local economic development level. The industrial economy of the county has been transformed from extensive development to resource-saving and environmentally-friendly development.

May 2018, ecological poverty alleviation meeting at Guanba Village

(3) Innovation

Based on its unique advantages in biological resources, Pingwu County focuses on exploring the "win-win" model of biodiversity conservation and poverty reduction, and has embarked on an ecological and environmentally friendly poverty alleviation road of "achieving prosperity without digging mountains and cutting trees". The first is to coordinate the construction of nature reserves and economic development, gather multiple forces to form an interest connection mechanism and promote the development of ecological poverty alleviation. Relying on domestic scientific research institutions to carry out ecological value assessment, and with the help of Alibaba, an Internet giant, the project expands sales channels. The second is to give full play to the advantages of characteristic agricultural resources, develop ecological information agriculture of "native species", create a characteristic agricultural industry, and embark on a new path of characteristic agricultural development that raises agricultural production in mountainous areas, increases farmers' income, and boosts rural prosperity. The third is to be based on the protection of giant pandas to create a new pattern of poverty alleviation through eco-tourism.

Pingwu County, under the guidance of the development concept of "green development as the foundation, ecology as the priority", coordinated the promotion of ecological protection and economic development. Relying on ecological and cultural advantages, it achieves multiple goals including biodiversity protection, economic development, and poverty alleviation by developing eco-agriculture and eco-tourism.

About the applicant: Chinese Research Academy of Environmental Sciences is affiliated to the Ministry of Ecology and Environment of the People's Republic of China, Around the national sustainable development strategy, it carries out innovative and basic scientific research on major environmental protection and is committed to providing strategic, forward-looking and overall scientific and technological support for national economic and social development and environmental decision-making, meeting the engineering technological and consulting needs of major environmental issues in economic and social development, and playing an important role in national sustainable development strategy and environmental protection.

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Conservation and Sustainable Utilization of Biodiversity in Qiandao Luneng Resort

Hangzhou Qiandao Lake Global Travel Company of China Green Development Group

Approach: Sustainable use of biodiversity

Target: Freshwater and wetland

Location: Chun'an County, Zhejiang Province, China

Year of Implementation: 2018

Background

As the practice base of "lucid waters and lush mountains are invaluable assets" and the first ecological special zone in Zhejiang Province, Chun'an County aims to build on the characteristics of its own, strengthen ecological functions, and strive to achieve the overall goal of the beautiful environment, and common prosperity through the development and upgrading of green industries. In Chun'an County, there are numerous mountains, vast open waters, beautiful natural environment, and also the tradition of hosting bicycles, marathons, and other events. The Chun'an Asian Games Sub-village of the 2022 Hangzhou Asian Games is located in the Qiandao Luneng Resort of Jinshanping Block, which is expected to take advantage of the opportunity brought by the Asian Games to create an international recreational holiday destination and promote the transformation and upgrading of the tourism industry in the Southwest Lake Area.

The project site is located on the Jieshou islands, which extends into the lake as a whole in a finger shape. The lakes and islands are interwoven, dotted with intricate docks, combined with winding shorelines and numerous islands, a unique space and from is presented including such space elements as mountains, woodlands, bays, island chains, enclosed lakes, and peninsulas, exhibiting excellent landscape resources. The water quality in the area is excellent, reaching the national Class-Ⅰ surface water standard; the native vegetation in the area grows well, and there are relatively rich economic fruit crops. The soil is red sandy soil, which is relatively acidic and prone to weathering, resulting in some

Base nature

bare land that requires a certain degree of ecological restoration. Animals that could be observed on normal days and plant species in the base are relatively abundant, especially avifauna and fish.

Main activities

Following the ecological survey and consultation report by the Institute of Zoology, Chinese Academy of Sciences and the Protected Area Friendliness System Research Group, and following the principle of "protection first and ecological development as a priority" , the project carries out restorative green development based on the full assessment of the ecological carrying capacity is conducted. An ecological Wuyou Township following the concept of "symbiosis-connection-sharing" has been established, where seven ecological improvement plans were proposed, namely, the seed plan, color plan, ecological interconnection plan, sponge plan, integrated habitat construction plan, animal restoration and conservation plan, and ecological operation plan.

①The seed plan selects seeds or saplings from native plants to create a patchy mixed plantation with other bush species. The ecosystem should spontaneously reach balance within a few years.

②The color plan divides the area into different spaces, and uses plant species with different colors in areas with high appreciation-value or interaction value. Thus, it improves this area's distinctiveness within the Qianadao Lake region.

③The ecological interconnection plan intends to build "slow-ways" that integrate with animal tracks but without disturbing them. Therefore, leading people into nature and nature coming back to the community.

④The sponge plan introduces ecological measures such as bioretention, rainwater gardens, and wetlands in vertical habitats (on mountains or created by gullies), to increase the amount of rainwater infiltration and reduce the pollution load of rainwater runoff.

⑤The integrated habitat construction plan implements ecological development strategies for mountains, gullies, water body and revetments, to gradually restore vegetation, forests and wetlands.

⑥The animal restoration and conservation plan intends to protect fish, birds and insects, turning the place into a paradise for plants and animals.

⑦The ecological operation plan expects to build bases for restoration demonstration, nature education and ecological industry, and build ecological culture and community experience centers to host all kinds of visitors.

Main outcomes

(1) Ecological value

The land and water area of Qiandao Luneng Resort Project are 6,300 mu each, retaining a relatively complete system of ecological value on the Jieshou islands in the Southwest Lake Area. Qiandao Lake is a highly important strategic water source in East China, providing high-quality drinking water for the East China region, and an important recreational destination and a source of organic fish for the people of the whole country and the world. The project base is located in the 25th Area(Huangshan-Huaiyu Mountains) of biodiversity conservation priority in *China National Biodiversity Conservation Strategy and Action Plan*(2011—2030) , possessing important ecological conservation value. As an important habitat of migrant birds, the waters in this area currently boasts 179 species of avifauna recorded. It is also an important freshwater fish base in Zhejiang Province, with 114 species of fish resources recorded in various forms. Besides, the species resources of insects are also abundant. The black-eared kite(*Milvus migrans*) a national class-II key protected wildlife in China, is extremely common in the region.

(2) Social-economic value

Qiandao Luneng Resort Project, as the largest cultural tourism project in Chun'an County, will undertake the dual responsibility of the construction of a Chun'an Asian Games sub-village in 2022 and the provision of support for events. Its green and sustainable ecological development practical experience will provide experience and reference for the development of similar projects in Chun'an, the Yangtze River Delta and even the whole of China, due to its strong typical and scalable nature. The project's practical methods and measures regarding biodiversity survey and protection, systematic governance of ecological system comprising mountains, waters, woods, farmlands, lakes and grasslands, and sustainable utilization of ecological

Biodiversity survey

resources can be promoted within the county from a single site to a whole area, helping local developers and residents improve their awareness of and capability in biodiversity conservation and sustainable utilization, as well as development path innovation, to properly protect the "lucid waters and lush mountains" of Qiandao Lake and transform them into "invaluable assets" for the people of Chun'an.

(3) Innovation

Based on the unique spatial distribution of the lakes and islands in the project base, numerous islands, and the distribution of native fauna and flora resources, the project sets up major fauna and flora observation stations as bases to connect the lakes and islands in feature tour routes. With complementary natural research and education courses, the project enables interested participants to discover the mysteries of nature in the original ecological environment through natural observation and easy exploration of nature and to comprehend the meaning and value of life.

Lake and island resources

About the applicant: China Green Development Group(CGDG) is a diversified central enterprise with green development as the main line and green energy, happiness industry, green real estate and strategic emerging industries encouraged by the state as the main development direction. Its subsidiary Hangzhou Qiandao Lake Global Travel Company engages in the development, construction and operation of culture and tourism projects of Qiandao Luneng Resort based on the principle of ecology and green development, and is committed to building a benchmark project for ecological cultural tourism in the Yangtze River Delta.

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Forestry Carbon Sink Project in Inner Mongolia Shengle International Ecological Demonstration Zone

China Green Carbon Foundation

Approach: In-situ conservation

Targets: Forest; Grassland; Arid and semi-arid area; Flora; Mammals; Avifauna

Location: Horinger County, Inner Mongolia Autonomous Region, China

Year of Implementation: 2010

Background

Horinger County is located in the middle of the Inner Mongolia Autonomous Region, with diverse topographies, including mountains, hills and rivers. It is the transition zone from the Inner Mongolia Plateau to the Loess Plateau. Its climate is the arid and semi-arid continental monsoon climate, with an average annual precipitation of 392.8 mm. This place is located just in the farming-pastoral ecotone, while the farming-pastoral ecotone in northern China is the most affected area by desertification in China in the past 50 years. In this area, the existing soil erosion area covers 1,053 km², accounting for 30.7% of the county's total land area, and the degree of soil erosion is 5,000 ~ 10,000 t/km²; the desertification land area covers 396 km², accounting for 11.5% of the county's total area; and the aeolian sandy soil area reaches 290 km², accounting for 8.4% of the county's total land area. In addition, since people's demand for water resources in production and life continues to expand while the groundwater level continues to decline, water shortages are becoming more and more prominent. Under the ever-increasing development pressure, these ecological problems are still deteriorating. Lessons from the past remind us that we must repair the wounds that development has brought to the environment, gradually establish a stable ecological security pattern, and solve the current major ecological problems, so that we can have sustainable prosperity.

Main activities

This project was jointly launched in 2010 by Lao Niu Foundation, Inner Mongolia Forestry Department, The Nature Conservancy(TNC), and China Green Carbon Foundation in Horinger County, Inner Mongolia. It is the first forestry carbon sink project that successfully developed in arid and semi-arid regions of China.

The project aims to drive community development, attract social resources to jointly participate in the ecological restoration process, and jointly consolidate the results of ecological restoration based on the climate target and the comprehensive restoration and management technology of arbor-shrub-grass compound land. The planned area of the project is located in the transitional zone from the Inner Mongolia Plateau to the Loess Plateau, which is the northern China sand prevention belt in the "building two green shelters and three ecological belts" strategy. On the one hand, this area is part of the Huhhot-Baotou-Ordos-Yulin economic zone, one of the national important development areas, and on the other hand, it is in the eco-fragile region. The area of the carbon sink afforestation project covers 2,191.21 hm^2. Through the implementation of the project, 200,000 t of emission will be reduced in the 30-year crediting period.

In 2013, this project was successfully registered with the Executive Council of *the United Nations Framework Convention on Climate Change*(UNFCCC) , and obtained the "Climate, Community and Biodiversity Standards(CCBs)" gold certification. In 2015, the project won the "China Charity Award – Most Influential Charity Project Award" issued by the Ministry of Civil Affairs. In 2016, it was selected as an outstanding practice of "Solution Database" of UNDP.

Main outcomes

(1) Ecological value

The project has identified an ecological restoration and protection planning method that is suitable for climate change in the arid and semi-arid areas. This method introduced an eco-regional assessment(ERA) approach, considered future climate change scenarios, and determined the priority areas for ecological restoration and protection in the assessment area through the assessment of important ecosystem service functions and important ecosystems and species. What's more, based on the overlay analysis of important ecological functions, key ecosystems and current situations of the ecosystems, the method can determine the priority areas and restoration targets for ecological restoration and protection.

The project experiment demonstrated a variety of ecological restoration models, including afforestation with a variety of native soils and adaptive tree species, and ecological gully management, so that the regional vegetation in the area with steep slopes and deep trenches, low vegetation coverage, bare rocks and serious soil erosion was restored significantly; and therefore, the local vegetation ecosystem and hydrological system have been restored, and ecological safety, water safety and

hard-won ecological restoration results have also been guaranteed.

With climate change scenario analysis and planning of priority restoration areas, the project is committed to restoring the forest ecosystem taking into account grass, shrubs and arbors based on scientific planning of local adaptive tree species. Through the restoration and reconstruction of the forest ecosystems in the arid and semi-arid areas, the project can not only absorb at least 200,000 t of carbon dioxide in the atmosphere, which contributes to the mitigation of global climate change, but also greatly improve the stability of the regional ecosystem, thus improving its ability to adapt to climate changes.

The project area is located at the eastern edge of the priority area for biodiversity conservation in West Ordos-Helan Mountain-Yin Mountain, adjacent to the priority area for biodiversity conservation in Taihang Mountain. Through the implementation of the project, the connectivity of the ecosystem can be effectively promoted. In the process of ecosystem restoration, the important biodiversity conservation priority areas will be connected gradually. At the same time, due to the protection and restoration of stable forest, grassland and wetland ecosystems, potential habitats have been provided for many species. By adopting biodiversity system monitoring, the populations and numbers of wild animals and plants have significantly increased. At the beginning of the project, there were less than 30 types of vegetation on the project site, and by 2014, there were 77 types of vegetation on each plot. What's more, mammals such as foxes and badgers, and birds such as Darian partridge(*Perdix dauurica*) , ring-necked pheasant(*Phasianus colchicus*) , Amur falcon(*Falco amurensis*) and crested lark(*Galerida cristata*) , which disappeared from the project site, have reappeared.

Photos before and after gully restoration and reconstruction of Inner Mongolia Shengle International Ecological Demonstration Zone Project

Ecological restoration effect display of Inner Mongolia Shengle International Ecological Demonstration Zone Project

(2) Social-economic value

① The project boosted the development of the community. According to statistics, about 74% of the population in the project area is in poverty(the latest poverty standard announced by the Chinese government is RMB 2,300) , and the annual per capita income in some areas is only about RMB 800. Therefore, the project has fully considered the development needs of the local communities at the beginning of the design and in the implementation process. The project adopts the principle of "autonomy and voluntariness" to attract the local communities to participate in ecological restoration and protection. As far as the carbon sink afforestation project is concerned, the project is expected to increase the per capita net income of local community residents by an average of USD 160.7 compared to 2011, and create more than 1.141 million work-days of temporary employment opportunities and 18 long-term jobs. So far, the project has benefited 2,690 rural households in 4 towns and 13 administrative villages. More than 10,000 people have benefited from the project. In the management and protection period, we work together with the community to explore the sustainable "ecological

poverty alleviation" model through animal husbandry under the forest, dry farming, sustainable grazing management, cooperatives, etc. Over the past year, some farmers in the cooperative have increased their income by RMB 8,890 on average.

The gully(left) before reconstruction and the gully(right) after reconstruction in the project site

② The project attracted social resources to ecological conservation. With the development of the project, more and more social forces are actively participating in the ecological restoration and development of the project site in different ways. In addition to the strong support from the government, all different social resources, such as scientific research institutes, social organizations, enterprises and community residents of the project site, participated in the ecological restoration in different ways to jointly consolidate the results of the ecological restoration.

About the applicant: China Green Carbon Foundation is approved by the State Council and registered with the Ministry of Civil Affairs on July 19, 2010. It is the first national public-raising foundation with primary targets of increasing foreign exchange, reducing emissions and addressing climate changes in China, and is also a charitable organization with the qualification of public fundraising certified by the Ministry of Civil Affairs. The business unit in charge is the Ministry of Natural Resources, and the Foundation is now directly under the State Forestry and Grassland Administration. The Foundation was assessed as a 4A-level foundation by the Ministry of Civil Affairs in 2013 and 2019; and it became the member unit of IUCN in 2015.

CHAPTER IX

Benefit Sharing of Genetic Resources

Conservation and Utilization of Biodiversity and Traditional Ecological Culture of Naxi Ethnic Community in Jinsha River Basin

Nanning Green Seed Poverty Alleviation Service Center

Approaches: In-situ conservation; Sustainable use of biodiversity; Access and benefit-sharing of genetic resources; Traditional knowledge

Target: Genetic diversity

Location: Stone City Village, Yulong Township, Lijiang City, Yunnan Province and its surrounding villages, China

Year of Implementation: 2014

Background

Located between Qinghai-Tibet Plateau and Yunnan-Guizhou Plateau, the mountainous area of northwest Yunnan has complex topography and diverse climate as well as one of the areas that are most abundant in biodiversity and multi-ethnic cultures in the world. According to the result of a baseline survey on agricultural biodiversity in Stone City Village and nearby villages of Yulong Township, Lijiang, Yunnan Province in 2013, the number of traditional crops and farm species planted by local farmers has gradually declined between 1980 and 2012; furthermore, the shortage of crop varieties affects agricultural production and farmers' livelihoods greatly. Other surrounding Naxi ethnic villages in Jinsha River Basin also face similar problems.

Main activities

In early 2014, assisted by Kunming Institute of Botany, Chinese Academy of Sciences, Guangxi Academy of Agricultural Sciences, Yunnan Agricultural University, and Nanning Green Poverty Alleviation Service Center, starting with the protection and utilization of farm seeds, Stone City Village carried out the harvesting of local traditional ecological culture and comprehensive improvement of the

community, set up a seed selection and breeding team with women as the main body, encouraged more young people to return home to participate in seed breeding and production, established seed banks, and increased the available diversity by using seed fields, participatory breeding and seed resource registration. Such work expanded to Wumu Village, Labo Village, and Youmi Village in the same basin gradually. Besides, they disseminate traditional ecological culture and Naxi Dongba culture by virtue of the villager communication platform named Jinsha River Basin Naxi Mountain Community Network, sharing experience on the conservation and sustainable utilization of agricultural biodiversity.

Community Seed Bank in Stone City Village

Old people and women backbones of seed conservation and breeding in Stone City Village

Main outcomes

(1) Ecological value

Lijiang River in Jinsha River Basin runs 615 km, covering an area of more than 20,000 km^2. The ecosystem in this region is very fragile, the geological structure is complex and soil erosion is serious. Agricultural production is severely affected by climate change. Nanning Green Poverty Alleviation Service Center, UNEP International Ecosystem Management Partnership, Kunming Institute of Botany, Chinese Academy of Sciences, Yunnan Agriculture University, and other scientific institutions and social organizations have conducted collaborated actions in the upstream of Jinsha River along with villagers from Stone City Village, Wumu Village, Labo Village, and Youmi Village, etc. The internal drive of the above four villages has been inspired in terms of the protection and utilization of agricultural biodiversity, conservation and inheritance of traditional knowledge and integrated development of the community. The work of community seed banks, participatory seed selection and breeding, the record and inheritance of Dongba culture, etc. has promoted the local ecology ,and restored agricultural production.

(2) Social-economic value

①The traditional farming system in Jinsha River Basin is the wisdom crystallization of Naxi ethnic group's sustainable utilization of nature and realization of biodiversity protection, and is an excellent embodiment of sustainable development of environment and livelihood.

Jinsha River Valley and Terrace in Stone City Village

②They started from the protection and utilization of agricultural biodiversity and crop seeds, and gradually formed a holistic perspective which includes the protection of locally traditional and ecological culture and integrated community development. In so doing, it may help enhance cultural confidence and collective action awareness among villagers.

③The excavation and inheritance of Naxi traditional farming culture and the cooperation and innovation mode of diverse groups has further promoted the conservation and sustainable use of local biodiversity.

(3) Innovation

①Practical activities combine traditional culture with modern science and technology, and agricultural experts and villagers work together to play complementary roles.

②In this case, the project attaches importance to the internal drive of villagers to protect and utilize agricultural biodiversity and traditional ecological culture. The communication platform established by villagers with the support of scientific research institutions makes the diversity of farming culture and the tradition continue.

About the applicant: Nanning Green Seed Poverty Alleviation Service Center was founded in 2013, based on the results of participatory breeding work carried out by the Action Project of Agricultural Policy Research Center of Chinese Academy of Sciences. Taking participatory development and action research as guiding principles, it encourages rural communities and public scientific research institutions to cooperate in the protection, utilization and innovation of farm species, and carry out action research on and diversified innovation of agricultural biodiversity, traditional knowledge and sustainable food system to promote the sustainable development of urban and rural communities.

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China Ecological Smallholder Union Wolong Project

Laotu Rural Eco-Culture Service

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Traditional knowledge; Education innovation

Targets: Ecosystem diversity; Forest; Farmland

Location: Wolong National Nature Reserve, Sichuan Province, China

Year of Implementation: 2018

Background

Wolong National Nature Reserve (WNNR) is home to over 50 kinds of mammals, 300 kinds of avifauna, and 4,000 kinds of floras. It is also home to ethnic groups of Tibet, Qiang, Hui, and Han for generations. More than 90% of the local residents still live a traditional life of farming and herding.

This reserve attracts a large number of eco-tourists every year thanks to its outstanding natural resources and world-famous brand "giant panda". However, lacking awareness of local resources, the local residents have almost no opportunity to participate in high-end activities with high ecological value. They can only provide basic services like cheap accommodation and catering. They do not have many opportunities to obtain ecological benefits, and are not enthusiastic about participating in nature conservation. Therefore, in 2018, Laotu Rural Eco-Culture Service, Yantian District, Shenzhen Municipality (hereinafter,Laotu) entered Wolong to implement China Ecological Smallholder Union Wolong Project.

Main activities

The project focuses on the WNNR, combining environment, culture, education, and economy in a cross-fields and diversified way and calling for more people to participate in biodiversity conservation. In fact, the project aims to support farmers in the surrounding communities of WNNR in organic ecological agriculture, promote the influence of local culture by highlighting the music, enhance the

advantages of local ecological tourism, culture, agriculture, and tourism resources, and introduce high-quality resources at home and abroad to meet diversified consumer demands. Besides, the project fosters local kids to gain cultural self-confidence and recognition, as well as realize the importance of participating in the conservation of local biodiversity by compiling local textbooks.

Laotu leads the advocacy of biodiversity and community cultural diversity, and cooperates with artists and anthropologists (Kun, Mo Lingfeng, Zhang Yuan) to create and perform impromptu music in Ganhaizi, Wolong Third Village

Since September 2018, the project has been executed in WNNR with information sharing meetings and field research to explore the possibility of designing a set of ecological agriculture practices and promotion methods based on local conditions. Meanwhile, courses and other product lines, operated in the mode of social enterprises, offer the villagers more direct benefits. Since 2019, the project group has got deeply involved in Wolong communities. They visited villages and fields, and co-worked with front-line government staff to comprehensively survey the agricultural issues confronting villagers in various aspects, for example, the development of local agriculture, the market trend of traditional crops, plant diseases, insect pests, and agricultural products. The project improved the existing official reports and research, sorted out the old varieties of traditional characteristic crops and old varieties, exchanged views with agricultural experts, and set up the blueprint for ecological agriculture in Wolong.

Main outcomes

(1) Ecological value

The project achieved two ecological impacts via ecological agriculture transformation and environmental education. Firstly, the transformation of ecological agriculture has fundamentally improved the influence of local agriculture on the ecological environment in Wolong. The project has invited agricultural experts to solve agricultural technical problems for villagers face to face, and offered technical guidance on response to plant diseases and insect pests in an ecological and organic fashion. Besides, it has set up an online community for Wolong agricultural exchange, and continues to provide agricultural machinery, organic pesticides, etc. Next, it improved the local economy via agricultural transformation and helped local residents recognize the goals of the practice; at the same

time, Laotu helps locals, especially the youth, learn about the significance of protecting the local ecology by building communities, workshops and compiling textbooks used in villages. The purpose is to enable more people to join ecological conservation.

(2) Social-economic value

Laotu has helped nearly 3,000 community residents and 50 local members of environmental protection groups and farmer cooperatives in WNNR, Xuebaoding National Nature Reserve, Three-River Source National Park, and Qilian Mountain National Nature Reserve. Also, it offers policy consultation on the development of national parks, village rejuvenation, poverty alleviation, and education innovation to government organizations such as Wolong National Nature Reserve Administration, Xuebaoding National Nature Reserve Administration and Giant Panda National Park. The sustainable development projects in nearly 10 villages have been developed. And nearly 200 urban teenagers and youngsters have been mobilized to directly join in solving to rural and environmental problems on protection of wildlife, garbage treatment, ecological agriculture, village education, left-behind children and elderly as well as the conservation of traditional culture, etc. Furthermore, nearly 2,000 urban residents participating online have been involved in media culture exhibitions, community concerts and ecological agricultural product fairs jointly built by urban youngsters and rural community residents.

Since 2017, Laotu has led teenagers and youngsters to participate in the "Open Class in the Mountains", and go deep into Wolong National Nature Reserve to carry out oral history, incubate community development public welfare projects and other immersive educational experiences

Laotu and Naturland, an organic smallholder organization, led Wolong local residents to carry out agricultural organic transformation

(3) Innovation

The contradiction between ecological conservation, cultural inheritance and economic development is a complex issue facing Wolong. Laotu has devised a system integrating both cultural development and green economic development. After the full research on local conditions, Laotu updated and applied concepts according to local circumstances and launched China Ecological Smallholder Union with Chinese characteristics instead of copying western models and experience.

Combining social, economic, and ecological benefits, organic agriculture proves to be an effective tool to balance the protection and development of Wolong.Laotu comprehensively empowers villages in Wolong and changes the nonmainstream practices of public welfare organizations in ecological agriculture, sustainable rural development, and poverty reduction. In this way, more farmers are willing to develop organic agriculture and participate in the conservation of biodiversity.

About the applicant: Laotu Rural Eco-Culture Service, Yantian District, Shenzhen Municipality is a social enterprise that leads the green lifestyle and provides innovative and sustainable development mode for China and the world. Laodu tells the stories of China's rural areas, exerts the strength of local rural communities, and devotes itself to realizing equal dialog between urban and rural areas and promoting sustainable rural development.

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Exploration on Sustainable Use of Caterpillar Fungus in Sanjiangyuan—Practice in Tuanjie Village, Qumalai County, Qinghai Province

Beijing Fuqun Social Service Center

Approaches: In-situ conservation; Public participation; Publicity & advocacy; Policy-making & implementation; Sustainable use of biodiversity; Traditional knowledge

Targets: Ecosystem diversity; Grassland

Location: Bagan Township, Qumalai County, Yushu Tibetan Autonomous Prefecture, Qinghai Province, China

Year of Implementation: 2016

Background

Crowned as "China's water tower", Sanjiangyuan is a global plateau biodiversity hotspot and where Bagan Township, Qumalai County, Yushu Tibetan Autonomous Prefecture is located. Besides, it is China's main water source and an important ecological security barrier, and the production area of caterpillar fungus(*Ophiocordyceps sinensis*) one of the unique rare species in Qinghai-Tibet Plateau.

Over the past two decades, excessive and inappropriate means of caterpillar fungus harvesting have damaged the alpine meadow ecosystem, while the number of caterpillar fungus has dropped significantly. Over 75% of the average income of herders in Tuanjie Village comes from caterpillar fungus. As soon as caterpillar fungus resources are exhausted, the livelihood of herders will be seriously affected in the future.

Large numbers of external caterpillar fungus harvesters are seriously jeopardizing the safety of wildlife and their habitats, and bring a sharp increase in non-degradable plastic waste. Some of the garbage is burned in open areas and thrown into rivers, bringing harm to people's health as well as aquatic life and water safety. Livestocks often get sick and die.

Main activities

Since 2016, Beijing Fuqun Social Service Center(hereinafter referred to as “Fuqun”) has started to build the model of natural conservation and sustainable development based on local community with the government centering on the natural resource of Caterpillar fungus, which is closely related to the benefits of local residents.

①In cooperation with the team of researcher Xu Ming from the Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, a participatory survey on the sustainable utilization of caterpillar fungus was carried out in the local area, improved the methods and tools of caterpillar fungus harvesting to reduce disturbance to vegetation and soil, The research results were submitted to the local government in the form of a written report. Fuqun formed the three-party mechanism of communication, cooperation, monitoring, and motivation among community, government, and experts.

Promoting scientific harvesting of caterpillar fungus in households

Garbage collection on grassy hill during Caterpillar fungus harvesting season

②Pilots the sustainable development of caterpillar fungus and herders' alternative livelihood, encourages the community to improve the management system of caterpillar fungus, and promotes scientific harvesting; utilizes the management system to restrict harvesting of external personnel.

③Established community protection areas and protection systems, and integrates patrol teams; carries out publicity and education on scientific harvesting and trains local environmental protection leaders to drive community action; has organized and compiled vivid Chinese-Tibetan bilingual manuals and wall charts on public education and the scientific harvesting of caterpillar fungus; organizes teachers and students to pick up plastic wastes in the wild, and arranges eco-environmental dramas with caterpillar fungus theme to promote community participation.

④ Developed sustainable alternative livelihoods and helped local ecological experience development to reduce herders' over-dependence on caterpillar fungus resources.

Main outcomes

(1) Ecological value

Since 2017, the number of external harvesters has decreased by 30% and 24,000 mu of the grassy hill has been protected. In 2019, as high as 94% of herders could recycle garbage to specified collection points and the waste left on grassy hills has been greatly reduced. The proportion of herders carrying non-disposable utensils and non-packaged food has increased by over 10%. Thanks to the garbage collection organized by the public, a total of 1,500 t of garbage have been collected and the proportion

of herders' participation in protection has increased to 92%. The project also promotes the community to build patrol teams to jointly patrol the area; herders have taken part in scientific researches at the caterpillar fungus base.

(2) Social-economic value

The villagers have increased their knowledge about Caterpillar fungus and accumulated experience in scientific harvesting; Fuqun has led the community to explore ways of sustainable alternative livelihood and reduced local herders' over-dependence on Caterpillar fungus. Fuqun has supported the local community to establish the corresponding Tibetan candy production and sale mechanism in a sustainable manner. Fuqun has identified and nurtured local leaders for eco-tourism and designed tours. Meanwhile, Fuqun introduced external resources to help local communities promote eco-tourism. Fuqun has supported local communities set up greenhouses for vegetables with an area of 150 m^2, and has conducted vegetable planting training. In this way, the local community could achieve vegetable self-sufficiency and support eco-friendly catering. Fuqun has improved the capability of and provided more opportunities for females and youngsters to participate in social affairs, promoting the fairness of the community. This project has been evaluated as an excellent case by the Chair on Sustainable Tourism Development in UNESCO Designated Sites with over 40,000 accumulated readings.

About the applicant: Beijing Fuqun Social Service Center is a public welfare organization dedicated to promoting "community-based nature protection and environmental improvement". We insist on participatory learning and community co-management to enhance local people's ability to participate in nature conservation, promote local nature conservation and community development, and finally realize the beautiful vision of "harmony between man and nature, balance between conservation and development". Their main activities include ecological poverty alleviation, ecological environment education in schools and villages, nature conservation and sustainable development of communities, etc., benefiting more than 10 schools and 24 villages.

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CHANDO Grass Planting in Himalayas

JALA Corporation

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity

Targets: Forest; Grassland; Mountains; Arid and semi-arid area; Flora; Germplasm resource conservation

Location: Shigatse, Tibet Autonomous Region

Year of Implementation: 2017

Background

CHANDO, a naturalistic brand from the Himalayas, is the core brand of JALA Corporation. Adhering to the original intention of the brand's public welfare initiative: "taking from nature and giving back to nature", CHANDO has always regarded protecting the ecological environment as an important corporate social responsibility. The "CHANDO Grass Planting in Himalayas" public welfare activity has been carried out for five consecutive years, turning 3.66 million m^2 of desert land into oases, which has played a positive role in promoting the sustainable development of the region, and received attention and affirmation from all sectors of society.

Since 2009, JALA Corporation R&D (research and development) Center has been conducting sustainable scientific research on water, vegetation, microorganisms, minerals, colors and breath in the Himalayas. As of 2021, 836 natural products, 524 new strains of bacteria in the Himalayas have been investigated and studied, a tissue culture system for 6 medicinal vegetation has been established, and an information database of Himalayan resources has been established, which provides scientific references to the protective development of Himalayan resources and regional biodiversity protection.

Main activities

Since 2017, the CHANDO Himalaya Environmental Protection Fund has continued to assist in

the treatment of sandy land and control and the prevention of desertification in Tibet through grass planting. Under the guidance of the Environmental Protection Department of the Tibet Autonous Region Autonomous Region, the first project of the CHANDO Himalaya Environmental Protection Charitable Foundation was launched in Yadong County, Shigatse City, Tibet Autonomous Region. As of August 2021, the CHANDO Himalaya Environmental Protection Charitable Foundation has donated a total of RMB 20 million to support the planting of 3.66 million m^2 of green ryegrass in Yadong County, Namling County and Lhatse County, Shigatse City, Tibet Autonomous Region. In addition, CHANDO has also successively carried out public welfare projects, for example, vegetation diversity protection and poverty alleviation by developing industries in the local area to boost the region's prosperity and development.

Logo of CHANDO Public Welfare Grassland

Main outcomes

(1) Ecological value

① Facilitating desertified land management. After CHANDO started grass planting, 2.66 million m^2 of desert land has been turned into green grassland, which can play the role of windbreak and sand fixation, water conservation, and restoration of some desertified areas.

② Increasing agricultural land area. In 2019, CHANDO planted 1 million m^2 of green ryegrass in the east of Aima Township, Namling County, which brought significant green manure effect to the land. After the green ryegrass was harvested, the land was converted to potato planting, successfully turning it into arable land and improving the economic benefits of the land.

③ Providing financial support for local ecological governance.

④ CHANDO uses innovative methods such as biological fermentation engineering and vegetation tissue culture to conduct protective and sustainable development research on precious resources in the Pan-Himalayan region.

(2) Social-economic value

Ecological + poverty alleviation benefits: transfer payments have increased the income of herders; free distribution reduces farmers' expenditures; party-building and poverty alleviation helps fight poverty.

Taking environmental protection and public welfare as the starting point, CHANDO has in-depth

CHANDO Public Welfare Grassland

cooperation with the local area to help improve local people's livelihood and economic development. The main impacts and benefits are on the following aspects: developing modern agriculture; promoting the development of tourism and assisting in the development of Lulang International Town, hosting Himalayas Trail Running and other activities in the local area every year; improving the quality of life for the local people and organizing regular beauty classes in the local area to promote the concept of beautiful and healthy life.

(3) Innovation

①The project takes into account the dual needs of society and enterprises. CHANDO chooses to carry out public welfare actions in environmental protection, focusing on Himalayan ecological protection, which not only meets the needs of local social development, but also fits the connotation of the CHANDO brand.

②The public welfare strategy has systematic planning and institutional guarantee.

③Public welfare communication focuses on brand building. Through live broadcasts, short videos, and on-site visits, it combines with the influence of the brand's own celebrity public welfare partner to give the public welfare project a bigger voice.

About the applicant: JALA Corporation, focuses on cosmetics, personal care products and beauty functional food industry, leading in scale and strength. JALA Corporation insists on developing into a digital-driven biotechnology beauty enterprise, establishing a corporate image of the perfect combination of the world's top technology and oriental aesthetic art, and being fully scientific and technological in R&D, manufacturing, retail, service, operation and image.

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Recognizing Indigenous People Rights to Ensure the Effective Conservation of the Biodiversity Hotspot in Veun Sai Siem Pang National Park

Non-Timber Forest Product

Approaches: In-situ conservation; Public participation; Access and benefit-sharing of genetic resources; Traditional knowledge

Targets: Forest; Flora; Mammals; Amphibians; Avifauna

Location: Cambodia

Year of Implementation: 2007

Background

The Annamites Mountains are located at the border of Cambodia, Laos and Vietnam and is one of the largest intact forest blocks in Southeast Asia. The forest in this region has undergone a continuous assault of predation for 25 years including illegal logging, poaching, wildlife trafficking and population pressures. This project took place in Veun Sai Siem Pang(VSSP) National Park which is home to more than 10 Critically Endangered Species, 250 species of mammals, reptiles, amphibians and birds.

Main activities

The Non-Timber Forest Products(NTFP) initiated conservation at VSSP forests through community engagement and environmental education. Its strategy is to address the isolation and vulnerability of the VSSP National Park by engaging Indigenous Peoples in forest resource management. The project obtains official recognition of community protection for VSSP National Park with the establishment of Two Community Protected Area and collaboration between local communities, further reducing illegal forestry activities and maintaining gibbon population in VSSP forest.

This project helped to officially establish VSSP National Park in 2016, consisting of 84.3% of

evergreen forest and 13% of deciduous and bamboo forest and extensive upland savannahs. Two Community Protected Areas(CPAs) were created at VSSP National Park.

NTFP also mapped Spirit Forests (Sacred Sites) of 5 indigenous village with a total area inside VSSP National Park and the buffer zone with a total area. 75% of the VSSP National Park was managed by local rangers from the 5 indigenous village.

Community ranger team was established within the 5 project communities and patrolled the park to deter poachers and illegal loggers and rangers removed snares and issued penalties. Conservation actions have a special focus on Northern buff-cheeked gibbon(*Nomascus annamensis*) and its habitat. Population of gibbons and other threatened species were assessed through monthly community patrols using community-led forest monitoring techniques, relevant laws, and equipment, such as GPS, map reading, as well as SMART-based data collection methods.

Main outcomes

(1) Ecological value

The two CPAs inside VSSP National Park were officially recognized by the Ministry of Environment in February 2019. The Park has recovered over 3,000 hm^2 of dense forest and the wildlife is more visible and safer.

(2) Social-economic value

During the participatory consultations, in all of the interactions with communities, and throughout the project planning, design, and implementation, NTFP operated under the guiding principles of free, prior, and informed consent. All aspects of the project have maintained a participatory focus, through consultations with the communities and relevant stakeholders, so that communities can make informed decisions and can be empowered to have active roles in the decision-making processes regarding natural resource use and conservation.

This project also helped to create 10 positions in Community Based Organization and Community Ranger Team and to train around 300 people with skills to become community warden, medicinal forests planter and veterinary. 5 buffalo banks were created and local families' income from chicken raising, pig raising and vegetable planting increased by 50%, 20% and 47% respectively. 24 wells were installed to provide safe water to nearly 2,800 people and 4 community buildings were built to improve welfare of local families.

(3) Innovation

①Community ranger team was established in the project and has regular patrolling schedule in the park to deter poachers and illegal loggers, as well as to remove snares and issue penalties.

②The project has fostered a strong partnership with the Ministry of Environment and the Provincial Department of the Environment. Through the cooperation, community wardens are recognized as key actors of conservation.

③Two CPAs were demarcated to recognize Indigenous Peoples' ancestral rights and to increase

their senses of responsibility. The sense of ownership has also allowed communities to assert their rights to repel land grabbers and outsiders came for natural resources.

④The community rangers decided on their own initiative to allocate half of their income from the sale of malva nuts to fund future patrols to continue protection activities on the ground.

About the applicant: Non-Timber Forest Product (NTFP) was founded in 1996, under project of Oxfam Novib and GB, localized from 1998 and registered with Ministry of Interior since May 2007. NTFP choose to work in the most isolated, wild, and intact places left in the N.E. where indigenous people are living. NTFP believes that equitable and unavoidable solutions to biodiversity destruction crisis must be owned and driven by local people.

CHAPTER X

Traditional Knowledge

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Local Actions of Biodiversity Conservation in Nyanpo Yutse

Nyanpo Yutse Conservation Association

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Technological innovation; Sustainable use of biodiversity; Traditional knowledge

Targets: Species diversity; Flora; Mammals; Amphibians; Avifauna

Location: Nyanpo Yutse, Qinghai Province

Year of Implementation: 2007

Background

Nyanpo Yutse, located on the eastern edge of the Qinghai-Tibet Plateau, is home to many rare and endangered wildlife species, including the national class-Ⅰ protected animal snow leopard, national class-Ⅱ protected animal otter, the endemic species of the Qinghai-Tibet Plateau, Tibetan bunting(*Emberiza koslowi*) , and the plant *Meconopsis barbiseta*, which is found only in Nyanpo Yutse.

Main activities

Over the years, the Nyanpo Yutse Conservation Association (hereinafter, the Association) has led local herders to survey and monitor the distribution and changes of wildlife species, wetlands, rivers, lakes, glaciers, and snow-capped mountains within more than 2,000 km^2 of Nyanpo Yutse. The survey indicates that there are at least 620 plant species, 300 fungal species, 42 mammal species, 180 bird species, 220 insect species, 9 amphibian species, 1 reptile species, and 5 fish species in the various habitats of Nyanpo Yutse.

The Association works with monasteries, schools and conservation organizations to provide targeted nature education activities for the local students and ordinary people in Nyanpo Yutse each year. The main activities include taking elementary school students from Baiyu Township to participate

in the Children of the Flowers program every summer, inviting nature conservation experts to give lectures, and holding dialogues and forums between scientists and monks to communicate the concept of nature conservation to the outside world.

In cooperation with monks and scholars familiar with traditional Tibetan culture, the Association has organized the collection and collation of traditional culture related to nature conservation, and officially published the *Landscape Culture of the Qinghai-Tibet Plateau*(Nyanpo Yutse Chronicles) , an encyclopedia of the bio-cultural diversity.

The Association trains local herders to use cameras to film and record the environmental and cultural changes that are taking place. Nearly 50 documentaries have been produced so far, including *Yak Dung*, *Tibetan Bunting*, and *My Himalayan Vulture*. It has greatly promoted the public's understanding of the concept of nature conservation in Tibetan areas while boosting the local people's more active participation in protecting the sacred mountains and lakes in their hometown.

With the Association's support, more than 20 nature conservation groups have been incubated and developed in Nyanpo Yutse and its surrounding areas, for example, From Our Eyes Filming Group, Black-necked Crane Women Conservationists Group, and *Meconopsis Barbiseta* Conservation Group. The Association has provided capacity-building training for these groups to help them improve their conservation skills and gain more external support and assistance.

Children of Flowers nature education activity organized by the Association

Main outcomes

(1) Ecological value

①The Association has recorded 1,408 species of wild fauna, flora, and fungi in Nyanpo Yutse and given Tibetan names to over 700 species by referring to the scientific nomenclature, which are included in the *Chinese-Tibetan-English Dictionary of New Daily Vocabulary*.

②Within the 15 km^2 of Tibetan Bunting Reserve, there is now a stable population of nearly 50 Tibetan buntings. The establishment of the white-eared pheasant reserve in the Mako River Forest helped the population of white-eared pheasants(*Crossoptilon crossoptilon*) recover from 34 to over 230 individuals.

Nearly 50 conservation projects have been initiated in collaboration with people from the communities and scientists, which includes Survey of the Distribution and Breeding Status of Tibetan Buntings in Guoluo Prefecture and Its Conservation, covering species and ecosystem surveys, nature education, conservation capacity building, livelihood development, etc.

(2) Social-economic value

The research results of the Tibetan Bunting Research and Conservation Project were published in *Journal of Zoology*, a prestigious journal in China.

The Association's documentary films have won various domestic and international awards and been featured on mainstream media.

Some publications of Nyanpo Yutse Conservation Association

Numerous monographs and handbooks have been published, for example, *Snow Leopard: Spirit of the Plateau*, *On Trash*, *200 Things You Should Know About Traveling in Tibet*, *Landscape Culture of the Tibetan Plateau* (*Nyanpo Yutse Chronicles*) , and *Handbook of Biodiversity in Sanjiangyuan.*

The project has hosted expert forums such as On Biodiversity in Nyanpo Yutse: Dialogue Between Tradition and Modernity.

Awards:

①2011, Ford Motor China Conservation & Environmental Grants, China Program(CEGC)
SEE -TNC Ecological Award; the 5th Yunnan Multi Culture Visual Festival: Community Filming Award;

②2018, the 4th "Session of Power of Love ME Innovation Funding" with 50,000 yuan

funding received;

③ 2019, the 3rd Session of Environmental Protection Charity Funding Plan—Towards Ecological Civilization: Salutation to Environmental Protection Pioneer, with a 500,000 yuan project fund received.

(3) Innovation

The Association focuses not only on biodiversity but also on cultural diversity, discovering how Tibetan culture sustains the harmonious coexistence of humans and nature and applying such knowledge to a range of work, including conservation and publications. For example, the Association has worked with 23 local monasteries and established the Tibetan Bunting as the sacred bird of Nyanpo Yutse.

Fungi investigation by members of the Association in the field

The Association's work not only respects tradition, but also incorporates scientific knowledge, promotes the renewal of knowledge among local communities, and actively works in close cooperation with outside institutions to launch a series of studies such as flora and fauna monitoring, promoting an equal dialog between local and external conservation values, working methods and knowledge. This has also provided many local people with opportunities for training, participation in conservation jobs, and patrol monitoring.

About the applicant: Nyanpo Yutse Conservation Association was registered and established in Jiuzhi County Civil Affairs Bureau in December 2007, and its members are mainly local monks and herders. The Association leads community members to monitor the changes of wildlife, snow-capped mountains and glaciers, carries out environmental education activities for local students and ordinary people, records the changes of ecological environment and traditional culture in the surrounding areas of Nyanpo Yutse by means of images and words, and combines traditional culture with modern science.

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Integrated Conservation of Ganjia Grassland Ecosystem

Xiahe Darjie Tourism and Culture Development Co., Ltd.

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Sustainable use of biodiversity; Traditional knowledge

Target: Grassland

Location: Ganjia Grassland, Xiahe County, Gansu Province, China

Year of Implementation: 2016

Background

In Ganjia Town, Xiahe County, Gansu Province, Ganjia Grassland has an area of 800 km^2 and a population of 8,000, mostly of Tibetan ethnic, with livestock husbandry as its main source of income. Ganjia is located on the border between Qinghai-Tibet Plateau and Loess Plateau. With an average altitude of over 3,000 m, Ganija is rich in biodiversity and is the habitat of many endangered species such as snow leopard and black-necked crane, and is also one of the few areas that retains the traditional grassland management mode of rotational grazing and shared grassland. Based on this, a coupling system of symbiosis among people, grass and livestock is formed, which has strong adaptability in face of uncertainties such as climate change and creates a good interactive relationship with biodiversity.

The conservation targets of this project are Ganjia Grassland and wildlife such as the upland buzzard(*Buteo hemilasius*) . During the action, the environmental protection team realized where the source of local environmental problems lies. During the process of modernization, people's lifestyle and attitude towards nature have changed rapidly, which leads to an unbalanced atmosphere and behavior that only pays attention to the instrumental value of natural resources and the blind pursuit of convenience and development. This in turn, leads to the decline of grassland biodiversity and traditional ecological culture, and the decline of adaptability and resilience to changes in climate and

market, which has a negative impact on the restoration and protection of grassland ecosystem.

Main activities

Based on the above problems, the environmental protection team determined the way to solve the problem:

①To restore the vitality of traditional grassland management based on local ecological knowledge and paying attention to overall balance formed by local communities in long-term day to day practice.

②To carry out community-based local conservation, by taking the common but neglected upland buzzard, which has a good regulation effect on ecological problems such as "pika damage", as the flagship species.

③To improve herders' livelihood, reduce grazing pressure, and enhance cultural pride and protection awareness by combining plateau biodiversity with local herders' wool handicrafts to generate green income.

The environmental protection team invited experts to carry out the following activities:

①The project conducted community interviews and field investigation training for herders. The herders comprehensively collected local grassland knowledge and raptor living conditions information, and sorted out grassland management papers and raptor protection handbooks for exchange and sharing with the government and scholars. They jointly discussed and agreed on raptor protection plans.

②The project trained herders in image recording, and the herders shot videos of local grassland management and raptor investigation and protection disseminated online and offline simultaneously, so that herders could pay attention to and improve grassland management methods again. Cooperating with local villages and schools to carry out raptor observation and knowledge dissemination activities, and developing the concept that "protecting raptors is protecting grasslands".

Nomadic migration of traditional governance in Ganjia Grassland

Education on nature conservation of the upland buzzard, a raptor in grassland

③Designing wool handicrafts according to the natural and cultural characteristics of local animals, and training the community in handicrafts. Building an online management team to sell wool felt animals to realize green income generation and promote sustainable utilization of biodiversity.

Main outcomes

(1)Ecological value

Through the overall management of grassland based on local ecological knowledge, the local community-based conservation with upland buzzard as its flagship species, and the sustainable utilization of biodiversity of wool felt animals, the project can effectively restore and protect local wetlands, mountains, grasslands, lakes and other ecosystems, as well as threatened umbrella species such as the upland buzzard, the snow leopard, the Pallas' cat(*Felis manul*) , the Chinese mountain cat, the black-necked crane and the black stork(*Ciconia nigra*) , which have good regulation effects on grassland ecology, so as to promote the conservation and sustainable utilization of local biodiversity and strengthen the functionality and connectivity of ecosystem on a larger scale.

(2)Social-economic value

①With the method of community participation in conservation, the project can effectively promote the community to become the main body of conservation, and improve the conservation awareness and cultural identity of 300 herders, so that they can actively improve grassland governance and protect wildlife. It has had 23 herders(including 13 women) participate in conservation with

handicrafts to reduce grassland pressure and promote sustainable development.

② It has summarized the local knowledge of grassland governance and the living conditions of raptors in 13 tribal villages in Ganjia, published *scientific* papers on grassland governance and raptors handbooks, connected the community with the government and scholars for communication, changed the academic view that Gansu is only a migration stop over for the upland buzzard, formed a conservation plan based on consensus, and carried out experience sharing on the sustainable use of biodiversity for many times.

③ Grassland conservation actions have been reported by China Tibet Network, Ideal Home and other media, with a reading volume of over 100,000 and a video broadcast volume of 500 people in offline ecological study tours. Over 3,000 handicrafts were sold, bringing income of RMB 140,000 to the community, with the highest monthly income exceeding half of the local per capita net income.

"Zhuobelolo", a wool felt handicraft made of plateau animals by herders

(3) Innovation

This project empowers the community to participate in conservation, collects information by combining tradition and science, and promotes the collision of knowledge of different systems through multi-party communication, which breaks through the barriers between people and decision makers in conservation cognition and action, restores the vitality of local grassland governance, and creates more space for community-based conservation mode.

About the applicant: Xiahe Darjie Tourism & Culture Development Co., Ltd., located in Xiahe County, Gannan Prefecture, Gansu Province, is a social enterprise that produces culture and tourism products with grassland characteristics, for example, wool felt hand-made plateau animals and ecological culture study tours. The company was established by the local environmental protection organization Shanjue Environmental Conservation Volunteer Group of Ganjia based on the local situation, with sustainable development as its core value.

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Practical Actions for the Protection of Biodiversity in the Natural Sanctuary in the Source Area of the Yellow River

Plateau Nature Conservancy

Approaches: In-situ conservation; Public participation; Sustainable use of biodiversity; Traditional knowledge

Targets: Grassland; Freshwater and wetland; Mammals; Others

Location: Yellow River Source, Sanjiangyuan Region, China

Year of Implementation: 2016

Background

The Plateau Nature Conservancy(PNC) brought the conservation concept of Cultural Landscape Protected Area, i.e., Sacred Natural Site to the source area of the Yellow River in Qinghai. Based on the educational background of the core members of the organization, the project started from two dimensions: scientific ecological monitoring and traditional ecological culture. Relying on the cultural system established by the Tibetan herders who have lived in the area for generations, and through scientific research, public advocacy, and community empowerment, the project is working to achieve the goal of protecting the flora and fauna in the natural ecosystem of the source area of the Yellow River, and their ecological service functions.

The special geographical location makes the Qinghai-Tibet Plateau a biodiversity hotspot for monitoring the global ecological balance. The project not only pays attention to the special ecological status of the Qinghai-Tibet Plateau, but also incorporates the unique culture of this region into its conservation practice, trying to establish a harmonious relationship between people and the natural environment, people and wildlife, and among people, using native culture as a link.

Main activities

①The project has cultivated five local environmental protection communities through public

education and community empowerment. It has been jointly and independently carrying out snow leopard population monitoring for many years, filling the gap of flagship species baseline survey in the Yellow River Source Park. It has been working with domestic research institutions to conduct pelage pattern and DNA individual identification of populations in the region, and to grasp more detailed information about the snow leopard population and its associated species in the region. In 2019, the project began to focus on another endangered wildlife species on the plateau, the alpine musk deer, by mapping the temporal dynamics of the species' population in the community, providing relevant nature education to teenagers and youngsters to deepen their understanding of the species. Meanwhile, it has trained villagers to conduct patrols to prevent poaching of alpine musk deer, etc. and a large number of poaching traps have been removed. In doing so, the project promotes the transformation of the community into a species conservation community.

②The project has distilled from the cultural system of the local residents the part related to ecological conservation so as to stimulate the willingness of local people to conduct ecological conservation and make it a habit. From 2018 to 2019, the project has conducted a survey on the sacred mountains and water sources of the Source Area of the Yellow River, and clarified the distribution of the Sacred Natural Sites and water network in the area. Since 2019, the villagers have independently planned and carried out two annual water source protection day activities. They have also organized the litter cleaning activities of sacred mountains and lakes every year, monitored the retreat of the Amne Machin glacier for 4 consecutive years, and carried out the survey of plant species in the Natural Sanctuary.

Main outcomes

(1) Ecological value

This project focuses on the role of traditional culture in maintaining the balance of an integrated ecosystem in the ecologically sensitive area of the Yellow River Source on the Qinghai-Tibet Plateau and uses both natural and social science tools to effectively mitigate conflicts between humans and nature. Through species monitoring and public education, local people can treat wildlife kinder and even take spontaneous conservation actions. This project aims to change the concept of human-wildlife conflict to human-wildlife coexistence and taps into the traditional wisdom

Training community species monitoring team

Recruiting national volunteers to experience the ecological culture of the Source Area of the Yellow River and understand and spread the conservation mode of Sacred Natural Site

of local people and combine the "mountains and waters" in culture with that in reality, so as to stimulate the local people's enthusiasm for protecting the natural environment. The project makes protecting herders and their traditional lifestyle a key factor of maintaining the ecological balance of the area and avoiding the dichotomy between human and nature. It encourages herders to adopt low-carbon and environmentally friendly consumption patterns, so as to reduce environmental pressure and better protect local biodiversity.

(2) Social-economic value

This project completely distills and applies the native culture most familiar to the local residents, and environmental protection actions have been carried out in both daily work and life, as well as religious activities. It allows people to supplement their livelihoods by organizing nature experience activities in cooperation with environmental protection departments or commercial institutions.

The activities in this project such as snow leopard monitoring and protection have been featured on media such as CCTV, which brought about great social repercussions. The cultural forum of Sanjiangyuan Sacred Natural Site held at the end of 2010 invited famous domestic scholars to attend, who confirmed the effectiveness of the Sacred Natural Site model, and it has won a good reputation.

(3) Innovation

①The executive team of the project is composed of local intellectuals with master's degrees or above in related fields, who are very familiar with the local culture. They can serve as a cultural bridge to refine and "translate" the relevant cultural elements so that people from outside will not be confused and can better understand the core and structure of the relevant culture.

②The project takes into account the people living in the region in maintaining the ecological balance, so that people and ecology are no longer in a dichotomous relationship, and it gives full play to people's subjective initiative to maintain ecological balance and protect species diversity through community work and other methods.

Picture of herders monitoring a snow leopard eating a deer (Danzeng Jiancuo/Photographer)

③The project integrates humanities and social sciences into the scope of thinking and practice on conservation of species diversity. Instead of having only external natural science teams as the main force for monitoring or conservation, the project tries to take local culture as the starting point and combines natural science with humanities research so that local people can gain more voice and carry out biodiversity monitoring and conservation in multiple dimensions.

The Sacred Natural Site conservation model is suitable for areas where indigenous people(including ethnic minorities) live and where traditional culture still plays a social role, and there is a high degree of overlap between these areas and the areas with significant biodiversity conservation effect in China.

About the applicant: Plateau Nature Conservancy was established on August 19, 2016 and registered with the Civil Affairs Department of Qinghai Province. On the basis of its devotion to scientific research and local traditional culture, the project is committed to fully considering the needs of local people, and working with all partners to choose sustainable methods to protect biodiversity and cultural diversity on the Qinghai-Tibet Plateau, so as to achieve sustainable coexistence and harmonious development of human society and natural ecosystem.

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China Water Source Protection Plan

Snowland Great Rivers Environmental Protection Association

Approaches: In-situ conservation; Public participation; Publicity and advocacy; Financial support mechanisms; Technological innovation; Sustainable use of biodiversity; Traditional knowledge

Targets: Grassland; Freshwater

Location: Qinghai-Tibet Plateau, China

Year of Implementation: 2001

Background

The Qinghai-Tibet Plateau encompasses the headwaters of the Yellow River, the Yangtze River, as well as the Lancang-Mekong River and other famous rivers. These great rivers are the source of life for billions of people in China and other parts of Asia. The Sanjiangyuan area is densely distributed with rivers, lakes, swamps, snowy mountains and glaciers. It is the area with the highest altitude, the largest area and the most abundant wetland types in the world. The water resources in Sanjiangyuan affect the fresh water resources of nearly 2.1 billion people in Asia. Due to climate change and garbage pollution, the Sanjiangyuan area is facing serious problems such as glacier and wetland retreat, water source drying up, land desertification and soil erosion, posing serious threats to ecological security. Therefore, sustainable water source conservation is of vital importance.

Main activities

Snowland Great Rivers Environmental Protection Association (SGR) took the scheme of Local Nomadic Rural Community Water Comprehensive Protection to conduct research and analysis, participate in community discussions, establish water resources co-management mechanism, set up a water protection fund, develop the community economy of ecological service and carry out community innovation education. The scheme covers monitoring & data collection, public participation, livelihood development, and community education, forming the water source protection mechanism with

inclusiveness, high participation, and sustainability.

① Comprehensive investigation on community water resources. Since 2016, SGR has investigated the water sources of the Yellow River, the Yangtze River, and the Lancang River. It has investigated a total of 10,000 water sources and collected the data on 6,670 water sources, which is the only large-scale water source investigation of the Sanjiangyuan region so far. According to the survey, more than 940 water sources and 30 small lakes have dried up, the thickness of the snowy mountain has decreased by 6 m and the snow line has risen by 72 m. A total of 120 water source stories have been collected. 2,330 people have participated in water source conservation, and more than 40 people have collected water sources data.

②Water resources conservation with the community as the main entity. 8 communities in the Sanjiagnyuan area have set up more than 60 public welfare water resources protection sites, and formed a joint management committee of natural resources. A water conservation fund has been established in five communities, with a total amount of around RMB 500,000. The community members have committed themselves to using the revenue generated from the fund for regularly cleaning rubbish every year, removing 460 t of garbage in the water source area covering about 285,000 mu each year.

Villagers are cleaning up garbage in water source area

Water quality monitoring by experts and local villagers

③Sustainable water conservation with a balance between development and conservation. Water conservation culture education and water quality monitoring training have been conducted in the communities of water source areas, and 48 important water sources have been restored with cultural restoration methods conducive to water source conservation. Training on ecological tourism and handicrafts has been conducted. On the basis of ecological protection, the local water protection culture has been transmitted, the achievements of water resources conservation have been displayed, and the development of tourism and handicrafts has improved the livelihood of local communities.

Main outcomes

(1) Ecological value

The comprehensive conservation scheme of China Water Source Protection Plan has

protected 285,000 mu of water sources in the Sanjiangyuan area. With water protection as the starting point, the project has maintained the ecological system of the whole alpine grassland on the Qinghai-Tibet Plateau in good operation, and protected the habitats of the rich species on the Qinghai-Tibet Plateau.

(2) Social-economic value

The case of comprehensive protection scheme for "China Water Source Protection Plan" has attracted the participation of many relevant parties, including the government, social organizations and scientific research institutions, etc., which has an important enlightening effect on the participants' understanding of water sources. The "Asian Water Archives Center", built in the later period, has received nearly 1,000 visitors. The most prominent part of the water source protection scheme is that it always takes people and the community as the center and the main body respectively, and emphasizes the participation of local herders, with the main goal of enhancing their ability and cultural confidence, which has produced a great positive effect on the local area.

(3) Innovation

①The ideological innovation is reflected in the "comprehensive conservation" scheme, which does not just simply focus on the single water resource, but rather includes the related water protection culture, development, education, and communication all. This protects the interests of the community and creates positive attitudes to and conditions for the protection of water sources based on the comprehensive development of the community.

②The methodological innovation is reflected in the association's integration of modern science and traditional culture, which complement each other, as the association respects local culture and traditional knowledge, and enhances the enthusiasm of local people to protect water resources.

About the applicant: Snowland Great Rivers Environmental Protection Association(SGR) in Qinghai Province was established in 2001 and has become a provincial non-profit environmental protection organization in 2008. In the past 20 years, relying on the ecological philosophy and excellent ecological culture of the Qinghai-Tibet Plateau, focusing on three major themes of "human cultivation, water protection and sustainable development of communities", together with the government and people from all walks of life, it has carried out a series of work to protect the environment and restore the nomadic lifestyle conducive to ecological conservation in the Sanjiangyuan area, promote the ecological conservation and sustainable development of community in the Sanjiangyuan area, and strengthen the attention of all sectors of society at home and abroad to the environment and development of the Qinghai-Tibet Plateau.

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Ecological Conservation and Community Development Project Around the National Park

Myanmar Environment Institute

Approaches: In-situ conservation; Public participation; Traditional knowledge

Targets: Forest; Flora; Mammals; Amphibians; Avifauna

Location: Myanmar

Year of Implementation: 2017

Background

The areas of this project are located at the periphery reserved forest area (potential buffer zone area) of a national park in Sagaing Region, Myanmar. This national park is one of the Key Biodiversity Areas (KBAs) in Myanmar which contains a great wealth of vegetation with an estimation of 1,720 plant species in total. It has a rich variety of wild fauna including the wild elephant, tiger, clouded leopard (*Neofelis nebulosa*), black bear, gaur (*Bos gauru*), banteng (*Bos javanicus*), sambar (*Cervus unicolor*), serow (*Naemorhedus sumatraensis*), wild boar, takin (*Budorcas taxicolor*), barking deer (*Muntiacus muntjak*), asiatic wild dog (*dhole*), monkey species (*Macaca* spp.) and a large number of bird species.

Known threats for the national park include loss of habitat, bushmeat hunting, medicinal products and the pet trade. Meanwhile, the village people living in the peripheral zone(potential buffer zone) and near the area rely on agriculture (particularly pulse and bean production) . Some local families support themselves from the income made by extracting forest resources.

Main activities

Five village communities are included in the proposed project using the CCCA (Community Conservation Concession Agreement) model, where communities will get the benefits by conserving the ecosystem and biodiversity. The CCCA model was introduced to Myanmar by Global

Environmental Institute(GEI) , aiming to eliminate major threats to Myanmar's diverse ecosystems including biodiversity by mainstreaming local communities' participation in conservation, while developing sustainable alternative livelihoods. Livelihood support was provided for pig farming and pulse and bean cultivation. Investments for pig farming and cultivation were provided and technical training and supports were given. Energy efficient stoves were also provided to the communities.

Main outcomes

(1) Ecological value

A total of 900 hm^2 of the two community conservation areas were established, where the communities patrolled and monitored the ecosystem and biodiversity. Through trainings of wildlife and plant monitoring, SMART patrolling, and conservation awareness talks and workshops, the communities received efficient ecosystem and biodiversity conservation skills, and protected 18 species of EN, VU, CR, NT status.

The forest condition within the conservation areas of reserved forest were improved and the ecosystem and biodiversity were restored through planting activities in the communities and conservation areas, and reduction in illegal cutting, animal trafficking and poaching with signed agreements among communities and local administrative authorities.

(2) Social-economic value

The major scheme of the community-based conservation is the voluntary participation of the villagers. A village development committee was established based on the voluntary participation and village agreement. At various stages of the implementation however, a broader group of community members were required to participate in various activities. Mostof the social and natural resource use information were identified during the Participatory Resources Assessment.

Training given to community people for forest survey

Monitoring of the community team within the community conservation forest

Community members patrolling at the conservation area

At least 2,000 women and 2,000 men in five target villages with direct human wellbeing benefited from improved agriculture, pig raising and apiculture. The majority of the communities are Bamar race and a small number of people are Shan-ni ethnic people. In all 5 target village communities, loans for pulse and bean cultivation and pig raising were provided. Training for pig raising and vaccination support were given by a veterinary expert. Regular visits and monitoring were made by agricultural and veterinary experts for controlling the agricultural pests and pig diseases respectively. 75 solar panels were provided in two village communities. A total of 300 energy efficient stoves were given to the 5 communities.

(3) Innovation

Based on the project reports, MEI and 3 other local social organizations prepared a policy recommendation for Myanmar central government to conserve forest, biodiversity and other important ecosystems in Myanmar.

At least 1 government policy at national or divisional level has been revised to better integrate community-based conservation based on the CCCA model piloted by MEI and three other local social organizations. According to the results of policy recommendation workshop conducted at the end of the project, at least 1 government policy was agreed in discussion by Forest Department to be included in conservation policy. It was principally agreed that Forest Department will try to integrate community-based conservation based on the CCCA model piloted by MEI and other 3 local social organizations.

About the applicant: The Myanmar Environment Institute(MEI) is working in the fields of environmental protection, social safeguard and climate change mitigation and adaptation activities. MEI's mission is to identify and analyze environmental problems both human-made and natural, and to evaluate the risks associated with these problems and examine alternative solutions for resolving them. Most of the members of MEI are former and current university academicians in geography, economy, botany, zoology, ecology and engineering. MEI also aims to collaborate with international organizations to enhance the environmental protection toward sustainable development.

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