

CASE I

Grassland Eco-compensation and Award Scheme in Xilingol League, Inner Mongolia Autonomous Region

Submitted by Inner Mongolia Agricultural University

1. Background

Inner Mongolia ranks the first of the five largest pastoral areas in China with the total area of grassland of 1.138 billion mu (appr. 75.9 million ha), accounting for 74% of Inner Mongolia's land area and one quarter of the country's grassland area. However, under pressures of population growth and lacking efficient conservation, grassland degradation and desertification is exacerbating in Inner Mongolia, which often leads to reduced level of ecosystem functions. Currently, in Inner Mongolia, the degraded grassland accounts for 59% of the total area, and average productivity has been reduced by one-third compared with the 1950s.

In 2011 and 2016, Inner Mongolia Autonomous Region successively instigated two policies aiming at grassland restoration – the “Implementation Plan for Inner Mongolia Grassland Ecological Conservation Subsidy and Award” and “Implementation Guidance to a New Round of Grassland Ecological Conservation Subsidy and Award (2016-2020)”. The purpose of the two policies was to guide herdsmen to reduce the level of grazing by providing graze-prohibition subsidy and grass-livestock balance award, so as to curve the trend of degradation and at the same time ensure livelihoods.

So far, the policy has been implementing for two rounds, with detailed policy information shown in Table 1. Main policy interventions include:

1) Grazing-prohibition subsidy. Prohibit grazing for five years in severely-degraded grasslands and part of the moderately-degraded grasslands, grassland with designated functions as well as core-conservation areas. The central government provides subsidies to herdsmen in relevant areas at CNY 7.5/mu annually.

2) Balanced-grazing awards. To determine balanced-grazing areas within non-prohibited grazing areas according to the identified carrying capacity-based grazing levels; generally, restoration potentials in these identified areas are relatively good, making rotational grazing practical. The central government provides balanced-grazing awards to herdsmen who conform to the requirements at CNY 2.5/mu annually.

3) Performance appraisal awards. Provide incentive funds to leagues/cities with significant effects on grassland restoration for further restoration and conservation. The allocation of incentive funds takes full consideration of the standard mu coefficient of each league/city. Meanwhile, to enhance the supervision efforts by introducing a grassland-keeper scheme to assist the law-enforcement officials in ensuring the effective implementation of the policy.

Table 1. Grassland Eco-compensation Subsidy and Award Scheme in Inner Mongolia

| | 1 st Round | 2 nd Round |
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| Policy Content | Grazing-prohibition subsidy: 6 CNY/mu* | Grazing-prohibition subsidy: 7.5 CNY/mu |
| | Grass-livestock balance award: 1.5 CNY/mu | Grass-livestock balance award: 2.5 CNY/mu |
| | Performance appraisal award: rewarding funds provided to regions with significant grassland restoration effects | Performance appraisal award: rewarding funds provided to regions with significant grassland restoration effects |
| | Forage seed subsidy: 10 CNY/mu | |
| | Subsidy for production goods: 500 CNY/household | |
| Total funds provided | Funds from central government: CNY 77.36 billion; matching funds from provincial government: CNY 30 billion | Funds from central government: CNY 71.78 billion; matching funds from provincial government: CNY 46 billion |
| Total area | 1.02 billion mu | 1.02 billion mu |
| Standard mu coefficient of the league city | Calculated as the average carrying capacity of natural grassland of each league city divided by that of the whole region; the latter one is 39 mu/sheep. | Calculated as the 5-year average forage yield of natural grassland of each league city divided by that of the whole region |
| Matching measures | 1. 800 CNY/head/yr of subsidy provided to newly introduced breeding rams & | 1. Combine grassland restoration compensation with targeted poverty |

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| <p>from provincial government</p> | <p>50 CNY/head/yr to thoroughbred cows and beef cattle</p> <p>2. Subsidize 20% (on top of the 30% from central government financial subsidy) for animal husbandry machinery purchase, making the overall subsidy ratio 50%</p> <p>3. 4000 CNY/person/yr of salary to herdsmen management staffs, of which 50% borne by financial funds at the autonomous region's level and the rest 50% by that at league/city and county levels</p> <p>4. 80,000 CNY/person of resettlement subsidy to migrators, of which 50% from financial funds at the autonomous region's level and the other 50% from those at league/city and county levels</p> | <p>alleviation, which requires a) 64% of compensation funds to be allocated to poverty areas, and b) compensation standard cannot be lower than the poverty-elimination line.</p> <p>2. Establish key grassland ecological function conservation pilots in grazing-forbidden areas. Subsidy standard for the core area of the grassland national nature reserve to be increased to 50 CNY, and that for water conservation area increased to 65 CNY.</p> <p>3. Provide a 5-CNY/mu/yr subsidy to the grass fields that are allowed to harvest forage.</p> <p>4. Set up an old-age supporting subsidy at 300 CNY/person/yr to herdsmen aged 60 and above living in the grazing-prohibition area.</p> <p>5. Set up an education aid providing subsidy at 3000 CNY/person/semester to herdsmen's children who is receiving higher education.</p> <p>6. Take a "bottom line & capping" measure for grazing-prohibition subsidy, with the capping limit referring to the per capita net income in the previous year, and the guarantee line as equal to the local poverty line.</p> <p>7. Develop the management capacity of the full-time grassland inspectors. A total number of 2,735 full-time inspectors are being contracted across the autonomous region, with financial subsidy amounted</p> |
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| | | to 58.12 million CNY provided annually, in which 23.5m from the autonomous level fund, 12.52m from the league/city level fund, and 22.14m from the county level fund. |
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* One hectare = 15 mu

2. Needs for policy adaptation

The criteria for subsidy and award are crucial in the success of the policy implementation. The current graze-prohibition subsidy is at 7.5 CNY/mu/yr and the grass-livestock balance award is at 2.5 CNY/mu/yr, while they did to an extent compensate for the losses caused by reduction of livestock, it wasn't enough to make up for the opportunity cost of the herder's participation to the scheme, and thus was not able to fully motivate herders to proactively reducing their level of grazing. At the same time, affected by the market fluctuation, most herdsmen are unwilling to sell livestock when the price is low, which not only increases the operating costs but also exerts pressure on grassland's carrying capacity.

In addition, grassland in Inner Mongolia is featured as highly heterogenous in terms of grassland types as well as levels of degradation. The unreasonable criteria of compensation are in nature against the variations across different compensating bodies, and leads to contradictions between supply and demand of ecosystem services. The establishment of reasonable compensation standards would provide an important basis for improving and optimizing the eco-compensation and award policy.

Xilingol League, located at the central part of Inner Mongolia Autonomous Region, is an important forage production base for animal husbandry in China. It has an grassland area of 290 million mu (appr. 19.2 million ha), of which 270 (appr. 18 million ha) million mu can be utilized, accounting for 28% of the total. Due to the unsustainable development practices and natural disasters, both the grassland area and coverage rate in Xilingol has been reduced, with biodiversity loss and reduced level of resilience. To this end, since 2011, Xilingol has started promoting and implementing eco-compensation and award policies with action plans formulated. In Xilingol, the identification of the subsidy uses a "bottom line & capping" method.

- The reference standard for grazing-prohibition subsidy has been set at CNY 9/mu/year with a bottom line for the total at CNY 5000/person/year and a capping as 1.5 times of the per capita disposable income of farmers and herdsmen in the league in 2015, i.e. CNY 18000/person/year.

- The reference standard for balanced-grazing award has been set at CNY 3/mu/year. Each sub-area within Xilingol league can identify its own rate and ways of implementing the policy. In order to keep the award number within a reasonable range, it is advisable to set a capping line referring to the per capita disposable income of inhabitants in the previous year. Additionally, a subsidy to the grass harvesting fields (i.e. fields that are allowed to harvest forage in the balanced-grazing area) has been provided at a standard of 5 CNY/mu/year.

Since the policy came into force, both the ecological conditions and local livelihoods in Xilingol has been improved. However, problems such as the low compensation standard, the less-developed supervision systems, the lack of social security system, and the lagging credit service have restricted the effects of the policy. Further optimization and improvement of the policy are needed. On one hand, there is a need to further enhance the subsidy standard and avoid the use of one-size-fits-all approach. On the other hand, it is worthwhile to consider improving the matched social security scheme for diversified income sources for aging and poor people in the region, as well as to providing preferential loans and taxes to herdsman who involved in the scheme.

3. The necessity of optimizing the policy

Grasslands in China is not only the main production site for high quality and green livestock products, but also an important pillar to the eco-security of the country. Especially, under the momentums of high-quality development (eco-oriented) and the fights for three battles (preventing and resolving major risks, targeted poverty alleviation and pollution control), the implementation of the scheme and identification of a reasonable compensation standard are key measures to achieve ecological conservation.

With the advancement of the grassland restoration in Inner Mongolia, fair and reasonable compensation standards would guarantee the efficiency and effect of the scheme. It also contributes to the “five in one” strategy deployed by the central government, which aims to advance all the five key development aspects (i.e. economic, political, cultural, social and ecological) in a coherence and comprehensive manner. The optimization of the standards could also provide decision-making basis to relevant departments (such as Ministry of Agriculture and Rural Affairs, Ministry of Ecology and Environment, State Forestry and Grass Administration) for the implementation of a new round of grassland compensation and award scheme.

CASE II

Crab-breeding Industry Development at the Gaochun Modern Agricultural Industrial Park, Jiangsu Province

Submitted by Nanjing Agricultural University

1. Policy Background

On March 29, 2017, the then Ministry of Agriculture and Ministry of Finance issued the “*Notice on the Establishment of the National Modern Agricultural Industrial Park*”, in which the central government plan to arrange 100 million yuan of supplementary funds for each county (city) that are included in the national modern agricultural industrial park (the Park) list. The supplementary funds are mainly used to improve the infrastructure conditions of the Park and to enhance the service capabilities of public service facilities. The Park is an advanced agricultural development platform, based on scaled planting and breeding which gathers modern factors of "production + processing + technology".

The modern agricultural industrial park is promoted as a major project by the agricultural departments of governments at all levels. As a new starting point, the Park will further expand and strengthen its dominant leading industries, promote the development of the entire industrial chain with modern production factors, and create a platform for farmers' innovation and entrepreneurship incubation. The national level-Park also aims to promote the establishment of similar parks at province, city, and county-levels, so as to contribute, as the main focus, to the promotion of rural revitalization.

The Gaochun Modern Agricultural Industrial Park (the Gaochun Park) identifies crab-breeding as its leading industry. It aims to improve the industrialization level through 1) standardized production, which includes standardized pond construction, low-density culturing, high-quality crab breeding, and water quality management, such as planting water grass and breeding snails to increase biodiversity in crab pond; 2) scaled production, which includes organizing small householders for unified sales through the establishment of farmer cooperatives and building Guchenghu brand for crab marketing; 3) branded management, specifically, the Gaochun Park has built a standardized green farming area, created the first national-level Chinese mitten crab breeding field, and formulated the country's first crab ecological breeding standard.

Before the policy intervention in Gaochun, farmers spontaneously bred crabs in small-scales, and have not yet formed a successful business model. In 2016, the breeding area was 200,000 mu with a yield of 40 kg/mu. Farmers favored high-yield high-density breeding methods, which

could mean up to 2,000 crabs per mu in the peak period. The results were communities with small individual sizes and high mortality rates – especially in the summer, in which the mortality rate can reach up to 50%, leading to water contamination. These harvests can only be sold at wholesaling markets at low prices.

The following interventions are proposed for better developing the Gaochun Park:

- 1) Improving the infrastructure conditions and the capacity of public service facilities for farmers, cooperatives, sales agent, private enterprise for processing crab products, as well as improving tourist facilities;
- 2) Strengthening leading industries, promoting standardized breeding of crabs, and strengthening scientific and technological support for water-environment management (to increase biodiversity in crab ponds) by promoting low-density cultivation technology, “ice fish + snail”-feeding techniques, water grass cultivation techniques, and water quality monitoring based on Internet of Things;
- 3) Promoting intensive management, developing leading enterprises, and expanding aquatic wholesale markets; establishing crab production and management cooperatives to achieve moderate-scale management;
- 4) Strengthening support for leading industries, including government financial input, financial loan, and social capital investment;
- 5) Formulating a strategy of Modern Agricultural Industrial Park to guide agricultural transformation to increase social capital, human capital, produced capital elements and natural capital. The strategy will be contributed to governments and can be applied in other regions.

2. Needs for policy adaptation

Since 2017, the central government supports the established agricultural industrial parks in the form of awards instead of subsidies. Driven by the above policy, provinces (municipalities and autonomous regions) have been actively promoting the establishment of modern agricultural industrial parks. In 2017, 10 provinces have organized a mobilization meeting for promoting the agricultural industrial park establishment. Among the National Modern Agricultural Industrial Parks that are in the process of formation, some have been doing well with effective policy interventions implemented, while others have not, leading to less-than-satisfied performance in the quality and benefits of leading industries.

The policy on national modern agricultural industrial park is still in the process of improvement, and there is still room for adjustment. This project will assess the role played by the modern agricultural industrial parks through scenario analysis. We also found some shortcomings in the

development of agricultural industrial parks, which can be summarized into the following four aspects:

- 1) The high cost of agricultural production, the less-developed intensive processing level, and the difficulties in developing intensive processing have affected its brand development.
- 2) Financial support was limited. The credit support indicator was 0.27, far from the target value of 1.1.
- 3) Operating mechanisms were underdeveloped. Many parks were underprepared in their management aspects. They lacked funds, full-time staffs, and facilities. In terms of scientific and technological support, although most parks have established cooperative relations with science and technology institutions, colleges, and universities, they were not close enough. The Gaochun park has not yet formed an effective incentivizing mechanism for attracting talents, incubating start-ups, and transforming scientific achievements.
- 4) Policy support was not enough. Some local governments had limited financial resources, and thus difficulties in making continuous investment; most enterprises were unable to obtain credit support due to the lack of collateral required by financial institutions. In terms of land use, the core area of the Gaochun park was restricted by factors such as basic farmland conservation and overall land use planning, leading to insufficient land available for the processing, logistics, research and development, and leisure services.

3. The necessity of the policy

The policy interventions followed the national and local policies on industrialization and high-quality development. The Ministry of Agriculture and Rural Affairs of China is the key policy-making body, and Jiangsu Provincial Administration of Agriculture and Rural Affairs is the local policies-making body for which our assessments can support or contribute information to.

CASE III

Ecological and green development of Tengchong City, Yunnan Province

(with regards to the MEE's "Two Mountains" Innovative Practice Base)

Submitted by the Department of Ecology and Environment of Yunnan Province

In accordance with the "green, ecological, organic and wild" concept, Tengchong vigorously develops green, healthy food and dietary supplements, focusing on the development of oil plants, plant-based functional foods, meat-based products, and Chinese herbs, etc. Tengchong also encourages development of food industry-based tourism enterprises, promoting the city's food industry towards the middle- and high-end structure.

1. Objective and measures

To promote the food industry with the idea of "scaled farming, processing and sales" and the integration of primary, secondary and tertiary industries, and to comprehensively enhance the supply level of green agricultural products as well as market competitiveness.

1.1 Developing green organic agriculture, and strengthening the development of green food bases

- To create a good agricultural production environment by strengthening non-point pollution monitoring and control, increasing the recycling of agricultural film and crop straw, and strengthening pollution prevention and control in aquatic and livestock breeding.
- To strengthen the standard-build for local green agriculture and food processing industry with an aim of reducing the use of pesticides and chemical fertilizer, and to establish and improve local production norms for green food-related processing industry.
- To enhance the demonstration and promotion of standardized production. To give full play to the leading enterprises and professional cooperatives to drive the demonstration, and build an agricultural standards promoting model of "demo-base + demo-households + radiation-households", and thus to improve the standardization of agricultural production.

1.2 Grassland conservation and development

- Grassland protection and management. To carry out grassland law-popularizing activities, and enhance the awareness of grassland protection for all. To organize and implement pilot projects of artificial grass planting within degraded grassland areas.
- To transform and upgrade the grass-pastoral industry. To implement the southern grassland development project and the animal husbandry transformation and upgrading project. The city now has 55 scaled grass-industry players, which provided more than 350 jobs and achieved an output value of CNY 79.37 million yuan.

1.3 Forest conservation and development

- Forest protection and management. To implement an afforestation area of 151,300 mu (appr. 10,086 ha), strengthen forest resource management, carry out forest fire prevention, and steadily promote forest pest control.
- Development of featured economic forests. Up to now, the city has a consolidated area of 1.6604 million mu (appr. 110,693 ha) of featured economic forest (such as plantations of *Juglans sigillata* and *Camellia oleifera*).
- To promote the transformation and upgrade of the wood processing industry. To guide, encourage and support wood processing enterprises to adopt advanced production technologies, and increase the comprehensive utilization rate of raw materials.
- To actively develop the under-forest economy. The city has an area of 985,000 mu (appr. 65,667 ha) under-forest plantation with 3,389 households involved, and a total of 164,800 of under-forest breeding with 2,687 households involved.

1.4 Management of wetland and nature reserves

- To enhance protection and restoration of wetland. To establish and improve the wetland protection and restoration system to ensure that the natural wetland protection rate rises above 51%. To carry out the general wetland certification work, that the general wetland certificated area is 4,295.81 hectares, accounting for 61.46% of the total wetland area.
- Enhancing management of nature reserves. To complete the assessment report on the current situation of scenic spots and geo-parks in Tengchong city. To conduct remote-sensing survey on changes of human activities in nature reserves.

1.5 Development of enterprises and brand-buildings

- To create a regional public brand. Combining with the advantages of Tengchong's eco-environment resources, culture, tourism and agricultural industry, to create a regional public brand that can represent its green food industry. To establish a regional public brand access system, focusing on creating brand for specialized agricultural products.

- With a focus on cultivating leading enterprises, to nurture new agricultural businesses and develop green food processing industry.
- To strengthen marketing and building green food brands. To guide business entities to strengthen quality management and brand operating, and promote the certification and production of green organic food.

2. Policy tools and needs for improvement

2.1 Grassland restoration

- Established various grassland conservation systems, including basic grassland protection system, grazing ban system, balanced grazing system. On the basis of summarizing the first round of implementation, and according to the requirements of the second round of grassland restoration subsidies and incentive policies, local laws and regulations were revised and improved.
- The total area of grassland in the city is 2.6922 million mu (appr. 179,480 ha), with available area at 1.5076 million mu (appr. 100,507 ha), including 195,000 mu (appr. 13,000 ha) of banned grazing area, and 1,132,300 mu (appr. 75,487 ha) of balanced grazing area. Firstly, to issue certificates of grassland ownership and the use right, and sign contracts. Secondly, for available grassland area, to provide “banned grazing subsidy” and “balanced grazing award”, and carry out “performance appraisal reward project”, that on a five-year basis, the central fiscal provides to herdsmen for their conduction of banned grazing or balanced grazing at 7.5 yuan/mu or 2.5 yuan/mu respectively, and through which to guide the grazing activities.
- Since the implementation of the grassland eco-compensation policy and the performance appraisal and reward project, Tengchong has achieved certain positive results in terms of grassland restoration, sustainable development of grass-fed animal husbandry and income increase of farmers. However, the low level of subsidies and the different departments implementing the policy constrain the effectiveness of the policy to a certain extent, especially in terms of increasing farmers’ incomes. There is a need to improve relevant policies: on one hand, to refine compensation categories and increase standards, and on the other hand, to strengthen management to avoid multi-departmental implementation.

2.2 Management of ecological forest

- Tengchong city started the work of forest eco-compensation in 1996; the work has gone through stages of preparation, zoning, demarcation, adjustment, compensation and improvement. The city has a total of 4.268 million mu (appr. 284,533 ha) of public

warfare forests and natural forests, accounting for 60.3% of the total forest area. Among which, 1,250,400 mu (appr. 83,360 ha) of state-level public welfare forests, 311,200 mu (appr. 20,747 ha) of provincial-level welfare forests, and 2,705,200 mu (appr. 180,347 ha) of natural forest halting-harvest protection area. In 2019, a total of 54.7333 million yuan of compensation funds were obtained from higher level government, including 24.381 million yuan of forest farmers' compensation funds, and 29.7253 million yuan of management and protection subsidies.

- The city will further strive for projects and funds for forest eco-compensation, so as to increase compensation standards, and increase forest farmers' income.

2.3 Specialized incentive policy

- Formulating supportive policies for each leading industry, that provide rewards to enterprises, cooperatives and family farms meeting relevant standards, and guide them to become stronger and bigger.
- With regard to the issue of low-level development of the "green food branding programme", next steps are: firstly, to strengthen the development of green food bases, with a focus on key featured industries, and through government guidance, enterprise orders, contract acquisitions, and "the party branch + cooperatives + households" cooperation model, to expand the scale of production, and establish a green ecological food base with an advanced benefit-linkage mechanism; secondly, to cultivate a series of leading companies with high sales revenue, and identify demo-family farms; thirdly, to recreate famous green food brands.

3. Case of business engagement: Binglang River buffalo agricultural cultural heritage tourism area, i.e. the plateau ecological pasture development project

Through a 2.7 million yuan capital support from the 2017 performance appraisal reward, the city drives an investment of tens of millions of yuan from an enterprise, integrating 10,000 mu (appr. 667 ha) of cultivated land, wasteland, and forest land to form a 1,200-acre core area of artificial grassland sightseeing pasture, with 16 km-long fences for the grazing area, 80 KVA transformers and power supply facilities, and 4,000 m² of cowshed and production facilities. This project, through grassland restoration, construction of agricultural tourism area, and combined with the natural scenery of the surrounding state-owned forest farms, shows a unique green industry business card for Tengchong's farming-animal husbandry combined eco-circular development model.

The completion of the project has greatly improved the grassland coverage rate, grass productivity, grassland carry capacity, and large-scale breeding rate and the in-house breeding

rate of cattle and sheep. It not only creates output value and provides employment for the surplus labor of the surrounding poor households, but also increases income of surrounding rural areas and households, and thus effectively accelerating the process of large-scale standardized breeding models.

CASE IV

Integrated landscape management of Hani Terraces in Yuanyang County, Yunnan Province

(with regards to the MEE's "Two Mountains" Innovative Practice Base)

Submitted by the Department of Ecology and Environment of Yunnan Province

Yuanyang Hani Terraces, located in Yuanyang County, Honghe Hani Yi Autonomous Prefecture, Yunnan Province, has more than 1,300 years of history of reclamation. Represented by its circular ecosystem of forests, villages, terraces and water system "four elements isomorphism", this landscape was rated as UNESCO World Cultural Heritage, Globally Important Agricultural Cultural Heritage and China's Important Agricultural Cultural Heritage.

1 Measures taken

In recent years, the local government has implemented a series of measures in accordance with the development ideas of "using eco-agriculture to promote cultural tourism, then to boost business and in turn to advance agricultural development".

1.1 Forest conservation and restoration

Protect forest resources around terraces and implement a new round of projects such as returning cropland to forest, reforestation of barren hills and closed hills, and forest nursery. Comprehensive remediation of the East and West Guanyin-Mountain forest area was initiated, the mountains were classified as provincial nature reserves, and the cumulative ecological revegetation in the area reached 256,000 mu (appr. 17,067 ha), while the area of soil remediation reached 74.67 km². A forest belt measuring 153.9 km was planted on both sides of the road in the heritage area, and subsidies were provided for state-owned public welfare forests and self-operated ecological forests, with a total of CNY 150 million invested for the Grain for Green initiative. Energy-saving stoves, solar energy and other new energy replacement projects were vigorously promoted, resulting in gradual reduction of firewood harvesting and the protection of forest resources.

1.2 Protection and maintenance of terrace water system

To address farmland irrigation and drinking water safety issues in the heritage areas, the government promoted the construction of the East Guanyin-Mountain Reservoir and a series of central fiscal financed small-scale agricultural water conservancy projects. So far, 16 small dams and ponds were constructed, 105 irrigation ditches were repaired and/or expanded, and 82

rural drinking water safety projects were implemented. Drainage ditches and water storage projects were implemented to increase water supply during dry season. Meanwhile, the idea of water resources management has been integrated into the village rules and covenants, and traditional ways of water management were kept.

1.3 Safeguarding terraces minimum & developing the “paddy-fish-duck” integrated breeding model

To promote the rationalization and standardization of the conservation of Hani terraces, strict regulations were implemented, making clear the rights and responsibilities at county, township and village levels, and strengthening the major role and responsibility that township and village have.

Combined with the “targeted poverty alleviation”, farmers were guided to implement the “paddy-fish-duck” integrated breeding model, so as to realize the comprehensive benefits of “multiple use of one water, multiple harvest in one field, multiple industries in one household”.

- Cooperating with leading enterprises to cultivate high-quality red rice, fish and duck fry, and distributing them free of charge to poor households, with a total of 240 tons of fish fry and 500,000 duck fry distributed.
- Policy subsidies such as for purchase and sale and comprehensive subsidies for agricultural productive materials, and support for new types of business entities to purchase and sell at guaranteed prices (e.g., guaranteed purchase price of CNY 7 yuan/kg for red rice, CNY 40 yuan/kg for terraced fish, CNY 2 yuan/piece for terraced duck eggs).

The cumulative implementation of the “paddy-fish-duck” comprehensive breeding demonstration has reached 32,000 mu (appr. 2133 ha), along with the issuance of CNY 2.99 million yuan in subsidies for good seeds, CNY 3.93 million yuan in agricultural productive material subsidies, and CNY 25.46 million yuan in subsidies for the protection of arable land. These resulted in the red rice cultivation of 90,000 mu (appr. 6000 ha) and the increased income of 28,000 farmers, including 12,000 poor households.

1.4 Development of terrace-affiliated products and terrace-cultural tourism

The development of special agricultural products such as terraced red rice, fish and duck eggs, as well as ethnic folk crafts such as embroidery and silverware, will enhance the various functions and values of terraces. Take the red rice production and marketing in the Hani terraces as an example,

- a series of normative documents such as the Terraced Rice Development Plan and the Terraced Rice Cultivation Standard were formulated;

- online and offline sales were promoted with more than 40 enterprises to establish product purchase and sale partners, and a successful e-commerce poverty alleviation model which established links among e-commerce company, county-level purchase and sale company, cooperatives and farmer householders; and
- red rice brand-marketing was promoted with a series of trademarks registered, and red rice-related deep processing and peripheral products developed.

Farmers in heritage areas were encouraged to set up village inns with ethnic characteristics, provide transportation and catering services, etc., so as to drive the rapid development of rural tourism. Interest-free loans were provided by the county government, with a total amount of up to CNY 100,000 per household. So far, 230 rural inns and restaurants and 11 tourism villages have been built. Cultural tourism facilities and products were also encouraged, examples included the creative practice base for the National Symphony Orchestra, and a special concert namely “Hani Symphony - Happy New Year”.

1.5 Other financial mechanisms include:

- 1) each year 30% of the ticket revenue from the company that is responsible of the heritage area tourism development is withdrawn to support local productive development.
- 2) actively soliciting CNY 120 million yuan from the State Administration of Cultural Relics for the renovation of traditional villages and traditional residential buildings, and carried out the renovation of 18 traditional villages and residences in the heritage area; actively striving for the traditional residential protection funds, and providing traditional residential buildings in five key villages with a subsidy of CNY 900 yuan/year.

2. Achievements and policy adaptation needs

The quality of ecological conditions improved significantly. A total of 74.67 km² soil and water loss area within the heritage site has been treated, the area of water conservation forest increased year by year, and the forest and grass coverage rate has reached 67%. Farmland water conservancy facilities and irrigation ditches improved gradually, drainage system are now running smoothly, with an irrigation rate of 39%. The 70,000 mu paddy red line was maintained through the promotion of “paddy-fish-duck” integrated breeding model, achieving the “multiple use of one water, multiple harvest in one field, multiple industries in one household” comprehensive benefits.

The development of tourism in Yuanyang County has led to the development of other industries, more people were engaged in tourism, the number of rural inns rose from 85 in 2013 to 446 today, and the number of employees increased from 510 to 2207. The number of

visits and tourism revenues continued to increase. In 2019, the county received 4.3 million domestic and foreign visits, total tourism revenue grossed CNY 7.94 billion yuan.

Although the above measures have achieved some results, there are still many shortcomings. Next step would be for Yuanyang County to further establish and improve the compensation mechanism.

- To explore the terrace award and compensation mechanism. Strictly implementing the Regulations for the Protection of Basic Farmland, and signing the Basic Farmland Protection Responsibility Letter at different levels to ensure a systematic management at county, township, village committee, village group and farmer levels. On the basis of the implementation of the comprehensive subsidies for agricultural productive materials and other policy subsidies, active exploring terraces award and compensation mechanism to effectively raise the income of the masses, enhance the enthusiasm of the masses to protect the land, grain cultivation, and achieve the normalization, institutionalization and standardization of terraces protection management.
- To improve and further implement the "ditch catcher" subsidy mechanisms in protected areas to ensure that every ditch and water source in the heritage area is patrolled and maintained by a dedicated person, so as to effectively enhance the protection and management of ditches and water sources.
- To explore the establishment of traditional residential protection mechanism. Strictly implementing the "protective management measures of the Honghe Hani terrace-cultural village and residence" and "guidelines on the protection, repair and management of the Honghe Hani traditional residence" to ensure a gradual restoration of the features of traditional residences. Exploring the establishment of a special fund for the protection of traditional residential buildings, realizing relevant expenses and subsidies, and enhancing villagers' enthusiasm for traditional residential protection.