



1st Stakeholder Consultation Report

The Economics of Ecosystem and Biodiversity (TEEB): Promoting a Sustainable Agriculture and Food Sector

Implementation in China

【Deliverable 4.1】

Oct 29-30, 2020, Tengchong, Yunnan, China



International Ecosystem Management Partnership
国际生态系统管理伙伴计划



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SUMMARY

The stakeholder consultation meeting held in Tengchong city, Yunnan province (Oct 29-30, 2020) was a follow-up activity to the 1st Project Steering Committee (PSC) meeting (July 03, 2020), at which Ecological and Green Development of Tengchong was selected by the PSC for the subsequent scenario analysis phase. This meeting is also the first being held at local level since the TEEBAgriFood project was initiated in China.

During the mission, two separate meetings and one field visit were scheduled. The first meeting was convened by Tengchong Municipal People's Government with presences from eleven local government agencies; the meeting aims to establish connections between the project implementation team with local authorities and to understand the overall situation of the place. The second meeting was held at the Bureau of Agriculture and Rural Affairs of Tengchong, with officials from the Bureau and representatives from business sector joined. At the 2nd meeting, a closer look at Tengchong's agriculture system was taken through dialogue.

Key messages from scoping:

1. An overview. Tengchong is a mountainous city located in the west of Yunnan Province, China, with a land area of 5854.75 km², a total population of 689,000, and 25.27 billion CNY (i.e. 3.56 billion USD) of GDP in 2019. The development of Tengchong relies very much on its good environment conditions and rich natural resources, such as mild climate, abundant water resources, and rich forest resources with great biodiversity.
2. The agriculture system. Tengchong has a very diversified agriculture production system, with major products such as rice, wheat, maize, canola, medicinal herbs, vegetables, tea, and fruits from crop farming, and pig, beef cattle, goat and poultry from animal husbandry. 2019 agriculture output value was 4.69 billion CNY (671 million USD), accounting for 18.6% of the GDP. Crop farming and animal husbandry as main pillars accounted 62.5% and 37.5% of the agriculture output value respectively.
3. Land use. In China, basic farmland and ecological protection red line are the two institutions set by the national government to ensure food security, and to protect environment and restore ecosystems. Currently, Tengchong has an area of 801 km² cultivated land, of which 666.5 km² is secured as basic farmland, and an area of 333.3 km² scattered grassland. The ecological red line area identified in Tengchong is 1675.97 km², accounting for 28.63% of the total land.
4. Development priorities. 2021-2025, Tengchong will apply the green development concept and put the idea of "green is gold" throughout all industries of economic and social development. For agriculture, local government is determined to develop high value-added agricultural products.

Medicinal herbs and beef cattle are the two industries that Tengchong will be focusing at in the upcoming years.

5. Agricultural pollution control. Tengchong is gradually replacing chemical fertilizers with organic fertilizers/farm manure, and using biological and other measures to prevent pests and diseases. Organic production is also encouraged. Delineation of restricted/no-breeding areas, establishment of large-scale breeding farms equipped with waste treatment facilities, and resource-oriented utilization of livestock manure have been used to prevent pollution from livestock.
6. Development of medicinal herb industry. There are more than 60 species of medicinal herbs planted, mostly indigenous. As of the third quarter of 2020, medicinal herb constituted 30% of the crop farming GDP. By 2025, the planting area of medicinal herbs in Tengchong is expected to reach 23,733 ha, with a yield of 30,700 tons. Breeding of elite species, standardized large-scale plantation, and brand-building (such as GPA/GI certification) will be subsidized.
7. Development of beef cattle industry. Tengchong plans to promote standardized scale/intensive beef cattle breeding with forage crop planted nearby, and over 60,000 heads of beef cattle will be added to the current stock of 140,000. In addition, 2 eco-ranches (667 ha each) are being planned to promote brand-building, to link with eco-tourism, as well as to against grassland degradation.
8. Drivers. Loss of young and middle-aged male labor force, climate change, food security, and demand for good and safe food are identified as drivers to food production in Tengchong.

Meetings with local stakeholders

Meeting 1 (15:00-17:30, October 29, 2020)

The meeting was opened by Mr. LI Qing-Lin, Deputy Director of Tengchong Municipal People's Government's Office, on behalf of Mr. GAO Yong, Deputy Mayor of Tengchong, by welcoming everyone particularly experts from UNEP-International Ecosystem Management Partnership (UNEP-IEMP) and Chinese Research Academy of Environmental Sciences, Ministry of Ecology and Environment (CRAES, MEE), and then followed by a short introduction of governmental officials from line ministries present at the meeting, including bureaus that are in charge of local affairs on environment, agriculture, natural resources, forest and grassland, water, meteorology and development (see attached the list of attendees).



Photo 1. Consultation meeting convened by Tengchong Municipal People's Government

Dr. LI Jun-sheng, Director of Institute of Ecology, CRAES, MEE and Dr. ZHANG Lin-xiu, Director of UNEP-IEMP gave greeting remarks at the meeting. Dr. HE Jialin on behalf of the project implementation team then gave a presentation on 1) what is The Economics of Ecosystem and Biodiversity for Agriculture and Food programme (TEEBAgriFood), 2) what additional information it can provide to support sustainable decision-making, and 3) potentials of combining it with local policy priorities.

Government officials then introduced the overall situation of Tengchong in their respective fields, followed by dialogues with the project implementation team. Overall speaking, local authorities are supportive, and good connections were established. Highlights of the discussion can be categorized into following eight aspects.

- 1) A social-economic snapshot of Tengchong

Tengchong city is located in the west of Yunnan province, with a land area of 5854.75 km², 18 townships under its jurisdiction, 25 ethnic groups and a total population of 689,000.

In 2019, the GDP of Tengchong was 25.27 billion CNY (i.e. 3.56 billion USD¹), of which 18.6% was from agriculture sector (4.69 billion CNY or 671 million USD), 39.2% secondary industry (9.92 billion CNY or 1.42 billion USD) and 42.2% tertiary industry (10.66 billion CNY or 1.52 billion USD). GDP per capita was 37,536 CNY (5367.6 USD).

2) Climate and water resources

Tengchong has a monsoon climate, with temperature between 0°C and 30°C, and an annual rainfall of 1532mm. Rainy season starts from May to October, accounting for 85% of the annual precipitation, and dry season is from November to April of the following year.

It has abundant water resources. Three river systems, namely Binlang River, Longchuan River, and Daying River, pass from north to south of Tengchong, carrying 8.1 billion m³ water yield annually. The tributaries cut cross and leave many mountains and valley basins formulated, with altitudes ranging from 930m to 3780m.

3) Forest resources

Tengchong is rich in forest resources, with a forest coverage rate of 75%. The Gaoligongshan Nature Reserve that traverses the entire Tengchong is basically primitive forest, and has more than 5,000 plant species and more than 3,000 animal species, which is known as “species gene bank”.

4) Land use

In China, basic farmland and ecological protection red line are the two institutions set by the national government to ensure food security, and to protect environment and restore ecosystems. Once identified as basic farmland, it means under no circumstances can its use be changed. Ecological protection red line refers to the implementation of strict protection of space boundaries and management limits in terms of securing ecosystem functions and services provisioning, ensuring environmental quality, and sustaining natural resource utilization.

According to the *Tengchong's Land Use Master Plan (the 2017 Adjustment)*, there are 801 km² of cultivated land in Tengchong, of which 666.5 km² is secured as basic farmland. The ecological red line area identified in Tengchong is 1675.97 km², accounting for 28.63% of the total land. It covers areas including development-

¹ CNY to USD exchange rate measured at 0.143 (December 2019).

prohibit zone, important ecological function zone, and eco-environment sensitive and vulnerable zone.

5) Development priorities

During the 14th Five-Year Plan period, the overall development idea is to transform Tengchong into a world-class healthy destination and a modern park city. It will apply the green development concept and put the idea of “green is gold” throughout all industries of economic and social development.

In line with the Green Food Programme proposed by the provincial government, Tengchong plans to make efforts to develop its broad health industry, which includes food, medicine, sports and tourism, through integrated development of primary, secondary and tertiary industries.

In terms of agriculture, local government is determined to develop high value-added agricultural products. Medicinal herbs and beef cattle are the two industries that Tengchong will be focusing at in the upcoming years. In 2019, Tengchong was selected by the provincial government, under its “one county, one food industry” programme, to develop medicinal herbs plantation with annual financial support of 30 million CNY (4.29 million USD).

6) Strategies or plans in relevance (under discussion)

Currently, local authorities are working on drafting the 14th Five-Year Economic and Social Development Plan and several specialized plans, of which Biodiversity Conservation Plan is led by Tengchong Branch of Baoshan Ecology and Environment Bureau.

7) Pollutions

Pollutions in soil is at the small scale, mostly caused by non-ferrous metal mines. Water pollution were mostly found in the rivers that flow through farmland and villages and towns. Rural domestic sewage, animal husbandry and agricultural non-point source pollution are the main causes.

8) Good practices

Lots of practices that help develop local economy and generate good income for people through sustainable use of natural resources and nurturing high value-added agricultural products were introduced as good models, such as fish culturing in paddy fields, planting aromatic plants, oil plants and medicinal herbs under forests, and the breeding system for a local traditional cattle species called Binglangjiang buffalo (bob bubalus).

Meeting 2 (08:30-11:00, October 30, 2020)

The meeting was held at the Bureau of Agriculture and Rural Affairs of Tengchong, chaired by Ms. LI Ping, Inspector of the Bureau, with officials from the Bureau and representatives from business sector joined. The meeting adopted a full dialogue form, through which a closer look at Tengchong's agriculture system was taken.



Photo 2. Dialogue with stakeholders from the agricultures sector

Key information from the dialogue include:

1) Tengchong's agriculture system

Tengchong has a very diversified agriculture production system. Crop farming (including economic forest for non-timber purposes) and animal husbandry are main pillars of local agriculture development. As of the third quarter of 2020, the total agricultural production value is 6.4 billion CNY (915 million USD), of which 4 billion CNY (572 million USD) was from crop farming and 2.4 billion CNY (343 million USD) animal husbandry.

Below is an overview of agricultural products in Tengchong as of 2019.

Crop farming			
	Product	Sown area (hm ²)	Gross output (tons)
1	Staple food (rice, wheat, maize...)	82,766	430,000
2	Canola	21,333	49,000
3	Medicinal herbs	16,800	16,000
4	Vegetables	12,000	190,000
5	Tea	10,000	13,648
6	Fruits	800	18,000
Livestock			
	Product	Stock (heads)	Output (heads)
7	Pig	595,000	780,600
8	Cattle	143,000	60,600
9	Goat	73,400	90,000
10	Poultry	2,015,000	3,362,000

Aquaculture			
	Product	Area (hm ²)	Gross Output (tons)
11	Aquatic products	7,200	10,100
	of which: fish culturing in paddy fields	5,666	

2) Greening its agriculture

In accordance with the zero-growth action of pesticides and fertilizers required by the national government, Tengchong is gradually replacing chemical fertilizers with organic fertilizers or farm manure, and using biological and other measures to prevent pests and diseases. For example, the use of chemical fertilizer in Tengchong has been reduced from 32,000 tons in 2018 to 30,000 tons now, achieving the negative growth as set by the target; meanwhile, green technology for pests and diseases prevention and control has been applied to an area of 745 km². In this context, organic production is encouraged by local government. Currently there are a number of tea, medicinal herbs, or tea-oil camellia organic production bases established in Tengchong.

Pollution from livestock is a serious environment issue. At present, Tengchong has 62,000 scattered livestock households and over 300 large-scale livestock farms, with large-scale rate at 20% only. To prevent pollution from livestock, in 2017, local government has delineated 70 restricted-breeding areas and 60 no-breeding areas, with a total area of 1207 km². At the same time, establishment of large-scale breeding farms equipped with waste treatment facilities, and resource-oriented utilization of livestock manure are highly encouraged by local government.

3) Agricultural industries of development priority

2.1) Medicinal herbs

In Tengchong, there are more than 60 species of medicinal herbs planted, mostly indigenous. Main species include amomum tsao-ko (*Amomum tsaoko*), polyphylla (*Paris polyphylla*), ginkgo (*Ginkgo biloba*), magnolia officinalis (*Houpoa officinalis*), marigold (*Tagetes erecta*), gastrodia (*Gastrodia elata*), sealwort (*Polygonatum sibiricum*), dendrobe (*Dendrobium nobile*), and taxus chinensis (*Taxus wallichiana* var. *chinensis*), some of which are both medicinal and edible. Some species use under-canopy plantation (e.g. amomum tsao-ko), some are grown in greenhouses (e.g. marigold), while some are planted in both ways (e.g. dendrobe).

As of the third quarter of 2020, the output value of medicinal herb plantation accounted for 30% of crop farming production. The planting area reached 201 km², with an output of 16,000 tons, an output value of 1.38 billion CNY (197 million USD), and a processing output value of 2.77 billion CNY (396 million USD).

According to the 14th Five-Year Development Plan for Tengchong's Medicinal Herbs Industry (under discussion), by 2025, the planting area will reach 23,733 ha, with an yield of 30,700 tons, an output value of 2.122 billion CNY (303 million USD), and a processing output value of 5.524 billion CNY (790 million USD). Breeding of elite species, standardized large-scale plantation, and brand-building (such as GPA/GI certification) will be subsidized.

2.2) beef cattle

Tengchong has a scattered grassland area of 333.3 km². So far, the development of beef cattle industry has been mainly in the form of smallholders free-range breeding, leading to grassland degradation.

Tengchong plans to promote standardized scale/intensive beef cattle breeding in the future, one that will entail substantial increase to the current stock. According to Tengchong's Implementation Opinions on the "1+3+6" Model for the Development of Beef Cattle Industry, Consolidation and Improvement of Poverty Alleviation and Effective Connection of Rural Revitalization, by 2022, over 60,000 heads of beef cattle will be increased in Tengchong, through the "1+3+6" model, i.e. to establish at least 1 standardized cattle farm in each village; each with no less than 300 heads of beef cattle in stock, and 600 mu (i.e. 40 ha) of forage crop nearby.

Binglangjiang buffalo (bob bubalus) is the only river-type buffalo found in China that has been raised in Tengchong for over 200 years. 2 eco-ranches (667 ha each) are being planned by 2021 to promote brand-building, to link with eco-tourism, as well as to against grassland degradation.

4) Drivers of agriculture development in Tengchong

Loss of labor force: nowadays, young and middle-aged male labor force are leaving rural areas for jobs in cities, leading to more women and aged getting trained and hired in the agriculture sector.

Climate change: it is said that there are less rainfall recent years, which enables Tengchong to be more conducive to food production. But it still suffers from extreme climatic events.

Demand for food: at the national level, the central government has set strict rules to secure land for production of food, particularly staple food. From a consumers perspective, there is a growing number of people in the country that are willing to pay more for food that is pollution-free and with better quality.

The meetings were followed by a half-day field visit to local agriculture companies, including a tea plantation base and a near-wild (i.e. under canopy) medicinal herbs plantation base.



Photo 3. Bio-measures taken in the tea plantation



Photo 4-6. Medicinal herbs dendrobe and polyphylla planted in oil camellia forest

List of Attendees

	Name	Affiliation	
1st Meeting (15:00-17:30, 29 October, 2020)			
1	LI Qing-lin	Deputy Director, Office of Tengchong Municipal People's Government	Government officials
2	YANG Ying-li	Deputy Director, Tengchong Branch of Baoshan Ecology and Environment Bureau	
3	ZHU Xiu-mei	Officials, Baoshan Ecology and Environment Bureau	
4	CHA Zheng-xiong	Officials, Tengchong Branch of Baoshan Ecology and Environment Bureau	
5	BI Zheng	Director, Tengchong Branch of Gaoligongshan Nature Reserve Administration	
6	HUANG Guo-bo	Deputy Director, Bureau of Agriculture and Rural Affairs of Tengchong	
7	XIE Wu	Deputy Director, Bureau of Forest and Grassland of Tengchong	
8	HUANG Zhi-hu	Deputy Director, Tengchong Bureau of Development and Reform of Tengchong	
9	YANG Chun-Li	Deputy Director, Bureau of Meteorology of Tengchong	
10	PENG Ping	Vice Head, River Chief Office, Tengchong Water Affairs Bureau	
11	LI Xin-juan	Officials, Bureau of Natural Resources of Tengchong	
12	WANG Jin-bo	Officials, Bureau of Statistics of Tengchong	
13	ZHANG Lin-xiu	Director, UNEP-International Ecosystem Management Partnership (UNEP-IEMP)	Project Steering Committee member
14	LI Jun-sheng	Director of Institute of Ecology, Chinese Research Academy of Environmental Sciences, Ministry of Ecology and Environment (CRAES, MEE)	
15	HE Jia-lin	Programme officer, UNEP-IEMP	Project implementation team
16	SUN Ming-xing	Assistant Professor, UNEP-IEMP	
17	LI Li	Assistant Professor, UNEP-IEMP	
18	DU Le-shan	Programme Officer, CRAES, MEE	
19	LIU Hai-ou	Programme Officer, CRAES, MEE	
2nd Meeting (08:30-11:30, 30 October, 2020)			
1	LI Ping	Inspector, Bureau of Agriculture and Rural Affairs of Tengchong	Government officials
2	HUANG Guo-bo	Deputy Director, Bureau of Agriculture and Rural Affairs of Tengchong	
3	ZHANG Yan-chang	Head, Unit of Medicinal Herbs, Bureau of Agriculture and Rural Affairs of Tengchong	
4	Mr. Liang	Officials, Unit of Animal Husbandry, Bureau of Agriculture and Rural Affairs of Tengchong	

5	YANG Ying-li	Deputy Director, Tengchong Branch of Baoshan Ecology and Environment Bureau	
6	CHA Zheng-xiong	Officials, Tengchong Branch of Baoshan Ecology and Environment Bureau	
7	LI Gen-qing	Yunnan Hujian Manor Biotechnology Co., Ltd.	Representatives from private sector
8	PENG Wen-tao	Tengchong Bencaoyuan Biotechnology Co., Ltd.	
9	WEN Pan-lai	Chenguang Biological Technology Group Co., Ltd.	
10	HUANG Zi-Zhang	Agricultural cooperative	
11	LI Jun-sheng	Director of Institute of Ecology, Chinese Research Academy of Environmental Sciences, Ministry of Ecology and Environment (CRAES, MEE)	Project Steering Committee member
12	HE Jia-lin	Programme officer, UNEP-IEMP	Project implementation team
13	SUN Ming-xing	Assistant Professor, UNEP-IEMP	
14	LI Li	Assistant Professor, UNEP-IEMP	
15	DU Le-shan	Programme Officer, CRAES, MEE	
16	LIU Hai-ou	Programme Officer, CRAES, MEE	