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Ideas and Recommendations for Development of Gauri Gvong *Phyllanthus emblica* Linn Industry

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Abstract Gauri Gvong *Phyllanthus emblica* Linn is fine variety domesticated by Lujiang Town farmers in Longyang District through many years. It has high economic and ecological benefits and is a medicinal and edible fruit in hot-dry valley regions. Gauri Gvong *Phyllanthus emblica* Linn planting ranks the first place in Baoshan City and even in the whole Yunnan Province. It introduced current situations of Gauri Gvong *Phyllanthus emblica* Linn industry in Longyang District and came up with development ideas, objectives and recommendations.

Key words Gauri Gvong *Phyllanthus emblica* Linn, Development ideas, Recommendations, Longyang District

Phyllanthus emblica Linn is a common plant and fruit. It is a common ingredient of many traditional and herbal medicines. It is also known as emblic, emblic myrobalan, myrobalan, Indian gooseberry, Malacca tree, or amla from Sanskrit amalika, is a deciduous tree of the family *Phyllanthaceae*. It is known for its edible fruit of the same name. *Phyllanthus emblica* Linn is fine variety domesticated by Lujiang Town farmers in Longyang District through many years. It is characterized by long life cycle, drought resistance, high water holding capacity, soil reinforcement, rapid growth and fruiting, bumper and stable yield, high ability of sprouting, and excellent greening effect. It is one of varieties with highest ecological and economic benefits in dry-hot valley regions. It is important medicinal and edible plant resource. Its juice is unique and nutritious. The edible rate is up to 84.1%. The pulp contains Vc 4.7mg, total sugar 5.07%, total acid 2.28%, water content 2.28%, amino acid and trace element. After processing, the Vc retention is up to 72%, much higher than other fruits and vegetables. In 1990, *Phyllanthus emblica* Linn is included into the *Chinese Pharmacopoeia*. Its fruit can be used as medicine, have function of clearing heat and relieving sore throat, good for stomach, promote digestion to eliminate stagnation, antidiarrheic, protect liver and neutralize the toxic effect of alcohol, anti-ageing, antibacterial, eliminate inflammation, reduce fat, reduce blood and skin care. Based on health care function of rich nutritious components in *Phyllanthus emblica* Linn, the WHO has designated it as one of the three health-care plant varieties to be widely planted in the world. In 1998, the Ministry of Public Health listed it into *Catalogue of Foods and Medicines Homology*. Developing *Phyllanthus emblica* Linn industry plays a significant role in building beautiful Longyang, ecological Longyang, and increasing income of farmers.

1 Generation situations and development strength of *Phyllanthus emblica* Linn industry

1.1 General situations of *Phyllanthus emblica* Linn industry

1.1.1 Area and distribution. Longyang District started developing *Phyllanthus emblica* Linn industry in 2012. By 2014, the planting area has reached 3666.66 hm², distributed in dry-hot valley regions of Nujiang River and Lancang River. Yangliu Township planted 1029.8 hm² accounting for 28.1%; Lujiang Town 827.53 hm² accounting for 22.6%; Mangkuan Township planted 474.67 hm² accounting for 12.9%; Pupiao Town planted 431.87 hm² accounting for 11.8%; Wafang Township planted 333.33 hm² accounting for 9.1%; Wayao Town planted 213.33 hm² accounting for 5.8%; Bingma Township planted 156.13 hm² accounting for 4.3%; Wama Township planted 133.33 hm² accounting for 3.6%; Shuizhai Township planted 66.67 hm² accounting for 1.8%. The fruit area reached 8 hm². In 2014, the yield reached 20 tons and output value reached 140000 yuan.

1.1.2 Fine variety determination and seed sprout supply capacity. In 2013, Gauri Gvong *Phyllanthus emblica* Linn was approved by Yunnan Provincial Fine Seedlings Committee as Gauri Gvong *Phyllanthus emblica* Linn. In Longyang District, there are 5 enterprises producing Gauri Gvong *Phyllanthus emblica* Linn seedlings, the seedling growing area is 11.2 hm², mainly distributed in Lujiang Town, Pupiao Town and Mangkuan Township, and annual seedling capacity up to 10 million plants. In 2014, it cultivated 9.8 million seedlings, including 5.5 million grafting seedlings and 4 million seedlings, the value is up to 18.9 million yuan.

1.1.3 Construction of socialized service development system. Since Longyang District started developing Gauri Gvong *Phyllanthus emblica* Linn industry, Longyang District actively encouraged large households to plant *Phyllanthus emblica* Linn, and valued development of cooperatives. By the end of 2014, the planting area of large household reached 139.07 hm² accounting for 3.8% of total area in the whole district. The area entering first fruit appearing period reached 28.4 hm², accounting for 20.4% of large household planting area; the area entering the best fruiting period

reached 8 hm², accounting for 5.8% of large household planting area. Mangliu Village in Lujiang Town established Yangsheng *Phyllanthus embica* Linn Cooperative to carry out pre-production, in-production and post-production services of *Phyllanthus embica* Linn. It is expected to promote large households to develop *Phyllanthus embica* Linn industry.

1.2 Strength in development

1.2.1 Early start and sufficient technological reserve. Longyang District is the earliest district developing Gauri Gvong *Phyllanthus embica* Linn industry in Baoshan City. In the process of cultivation and planting, it has accumulated rich experience, cultivated a number of farmer technicians and highly skilled middle-and-high-ranking forest and fruit technicians, the district has cultivated a good many self-taught expert, so the industrial development has sufficient technological preparation.

1.2.2 High quality and high market competitiveness. Gauri Gvong *Phyllanthus embica* Linn planted in Longyang District features big fruit with average single fruit 4 times the local wild fructus phyllanthi, mildly sour and astringent, little coarse fiber, and much juice and tender tissue. Compared with other popular varieties, Gauri Gvong *Phyllanthus embica* Linn has high performance of bumper, high resistance, excellent taste, high quality, and late mature period. According to wholesale price in Longyang District and Dehong Prefecture market, the wholesale price of Gauri Gvong *Phyllanthus embica* Linn is 6-11 yuan/kg, and Guangxi *Phyllanthus embica* has wholesale price is 5-7 yuan/kg. Market competitiveness of Gauri Gvong *Phyllanthus embica* Linn is obviously higher than Guangxi *Phyllanthus embica*.

1.2.3 High value of cultivation and rapid effect of promoting increase of farmers' income. Grafted seedlings will fruit in three years after field planting, enter the high-yield period in 5 years, the yield is up to 1 ton per mu, and output value per mu is higher than 6000 yuan, showing rapid effect of promoting increase of farmers' income.

1.2.4 Wide application and broad market prospect. Gauri Gvong *Phyllanthus embica* Linn products are widely applied and can be used for developing Aini tablets, and applied in candied fruit, fruit wine, sweets, and drinks, and health foods. According to incomplete statistics, at present, there are 11 pharmaceutical enterprises such as Taiji Group and Yunnan Baiyao Group Co., Ltd producing *Phyllanthus embica* Linn tablets, and 20 enterprises produce *Phyllanthus embica* Linn products. At present, Yunnan Province still has not established raw material production base, raw materials are in short supply and market prospect is broad.

1.2.5 Suitable land resource. Dry-hot valley regions with 800-1500 m altitude in Nujiang River and Lancang River are areas suitable for growth of Gauri Gvong *Phyllanthus embica* Linn. The suitable area is up to 34133.3 hm².

1.2.6 Favorable policy environment. Gauri Gvong *Phyllanthus embica* Linn has high economic benefits and ecological benefits. It is ideal tree for waste mountain developing local characteristic forest and fruit industry in dry-hot valley regions. In recent years,

the province, city and district attach great importance to development of Gauri Gvong *Phyllanthus embica* Linn and list it into key support projects. In order to promote development of Gauri Gvong *Phyllanthus embica* Linn industry, Longyang District People's Government issued Opinions about Construction of Gauri Gvong *Phyllanthus embica* Linn Industry in 2014, providing favorable policy environment for development of Gauri Gvong *Phyllanthus embica* Linn industry.

2 Existing problems

2.1 Little attention of leaders By now, there is still no leading group for Gauri Gvong *Phyllanthus embica* Linn industry and it lacks powerful organization and leadership. Leaders of most towns and townships lack common understanding of this industry, fail to take it as an essential work for promoting increase of farmers' income, fail to carry out effective guidance and propaganda, and have weak industrial awareness. Besides, farmers are not enthusiastic for planting Gauri Gvong *Phyllanthus embica* Linn.

2.2 Few improved varieties In two years ago, *Phyllanthus embica* Linn industry developed rapidly. However, the grafting seedlings are scarce. In addition to limited support funds, new area of *Phyllanthus embica* Linn planting is mainly seedlings, to reduce production cost. There are few improved varieties of Gauri Gvong *Phyllanthus embica* Linn. This greatly dampens planting enthusiasm of farmers and influences development of Gauri Gvong *Phyllanthus embica* Linn industry to a certain extent.

2.3 Weak support for production In recent years, Longyang District mainly relied on projects of conceding the land to forestry, shelter forest, state afforestation subsidies, and deserted mountain afforestation, and industrial poverty alleviation to develop Gauri Gvong *Phyllanthus embica* Linn industry. The support criteria is as low as 1800-4500 yuan/hm². This only satisfies funds for current year seedlings and cultivation, but not for base manure, topdressing, prevention and control of plant diseases and insect pests, and fostering management at later stage. As a result, the planting quality is not high, industrial development is not provided with working funds. Besides, township leaders attach little importance to development of Gauri Gvong *Phyllanthus embica* Linn industry, which influences the industrial quality.

2.4 Extensive overall management level Most farmer households are weak in awareness of science and technology. They take extensive management in newly planted Gauri Gvong *Phyllanthus embica* Linn. At later stage, the grafting, intertillage, fostering, fertilizer application, and pruning are not in place, which restricts development of Gauri Gvong *Phyllanthus embica* Linn industry to a certain extent.

2.5 Lagging of marketing, fresh keeping storage, and processing research works Grafted seedlings will fruit in three years after field planting, enter the high-yield period in 5 years, the yield of 3666.67hm² Gauri Gvong *Phyllanthus embica* Linn in Longyang District is up to 14000 tons in three years. However, there is still no research work related to marketing, fresh keeping

storage, and processing. Once fresh fruit of *Phyllanthus embica* Linn come into market in enormous quantities, farmers will suffer a great loss if there is no proper marketing and processing channels leading to surplus fruit.

3 Development ideas and objectives

3.1 Development ideas It is recommended to carefully implement the spirit of the 18th National Congress of the CPC, orient towards market, focus on benefit, rely on resource, take science and technology as guidance, take innovation as driver, and take building ecological civilized and beautiful Longyang as objectives, to make industrial structure adjustment. Besides, it is recommended to implement multi-level, diversified development, intensive production, improve quality, transform management mechanism, give prominence to processing, strengthen marketing, and realize integrated agriculture, industry and trade system, promote industrialization, boost competitiveness, and improve the overall quality and benefit.

3.2 Development objectives By 2016, it is expected to build 8000 hm² raw material base of Gauri Gvong *Phyllanthus embica* Linn, and realize annual fresh fruit yield up to 240000 tons and agricultural output value of 600 million yuan after reaching the best fruiting period. It is recommended to apply origin geographic identification certification of Gauri Gvong *Phyllanthus embica* Linn, build famous, excellent and special brand of Gauri Gvong *Phyllanthus embica* Linn, and make effort to build Longyang District into the hometown of China's Gauri Gvong *Phyllanthus embica* Linn.

4 Recommendations for industrial development

4.1 Strengthening leadership and boosting Gauri Gvong *Phyllanthus embica* Linn industry Gauri Gvong *Phyllanthus embica* Linn industry of Longyang District ranks the first place in the whole Yunnan Province. It is an industry with comparative advantages. Therefore, township government should fully realize importance of developing Gauri Gvong *Phyllanthus embica* Linn industry, strengthen industry awareness, incorporate this project into agenda, conduct propaganda and guidance work, and improve enthusiasm of farmers for planting *Phyllanthus embica* Linn, to attract more farmers to voluntarily engage in construction of Gauri Gvong *Phyllanthus embica* Linn industry. Longyang District government should set up leading group for Gauri Gvong *Phyllanthus embica* Linn industry, carry out leadership and coordination of industrial development, and further strengthen Gauri Gvong *Phyllanthus embica* Linn industry, to make resource advantage become economic advantage.

4.2 Accelerating variety improving work and promoting industrial quality Townships and towns should raise funds, organize specialized grafting construction team to carry out grafting work for seedlings planted two years ago, to make this industry become an industry really helping farmers to become rich and increasing their income. In this process, township forestry depart-

ment should provide technological services and collect information for specialized grafting team.

4.3 Increasing input and strengthening support It is recommended to establish diversified investment mechanism. The district finance should arrange special funds for supporting development of Gauri Gvong *Phyllanthus embica* Linn industry, and arrange certain working funds for policy propaganda, planning and design, and inspection and acceptance, to ensure the financial subsidies not lower than 600 yuan/mu. It is recommended to actively guide and encourage industrial and commercial capital and private capital to enter Gauri Gvong *Phyllanthus embica* Linn industry, and provide great credit support for base construction, large planting households, and intermediaries.

4.4 Reasonable planning and large-scale development It is recommended to stick to the principle of "suiting measures to local conditions and planting trees in suitable areas", select proper regions, make overall planning, planting in large area, development on large scale, extend fine seedlings and strictly comply with technical requirements, to reach the purpose of intensive management. For example, key areas can be distributed in Lujiang Town, Mangkuan Township, Yangliu Township, Wafang Township, Wama Township, Wayao Township, and Shuizhai Township.

4.5 Strengthening science and technology training to raise planting level Forestry department should strengthen science and technology training, carry out extension of bumper cultivation technologies, experiment and demonstration for Gauri Gvong *Phyllanthus embica* Linn, guide farmers to carry out subsequent management of new seedling grafting, pruning, intertillage and fostering, to raise planting management level of farmers. In addition, it is recommended to further establish and improve science and technology service network in planting areas, set up Gauri Gvong *Phyllanthus embica* Linn industry association, enhance extension of market information and technologies, select suitable areas to cultivate key and specialized villages for production of Gauri Gvong *Phyllanthus embica* Linn. At present, it is recommended to focus on Lujiang Town Conggang Village and Mangliu Village model villages, to promote surrounding villages and farmers to strengthen the *Phyllanthus embica* Linn industry.

4.6 Making active preparation and gradually promoting construction of storage and fresh keeping hardware facilities

The construction scale of base of Gauri Gvong *Phyllanthus embica* Linn in Longyang District is basically established. To realize standardized, healthy, sustainable and stable development, it is recommended to build fruit pretreatment center, fresh keeping warehouse, cold storage, and consider future deep processing. In the period of thirteenth five-year plan period, financial support funds for agriculture should mainly support one or two leading enterprises. These enterprises should provide pre-production, in-production and post-production services for Gauri Gvong *Phyllanthus embica* Linn, introduce foreign advanced fresh keeping, processing equipment and technologies, effectively provide high qual-

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plant cash crops, to obtain economic benefits and famous brand benefits, so as to boost rural economy.

5.3 Guiding development of new financial institutions under the premise of guaranteeing development of traditional financial institutions

Our study results indicate that there is a long-term co-integration relation between rural finance and rural economy of Yunnan Province. Therefore, government should issue pertinent policies to promote rural financial development, especially development of rural informal financial institutions, and carry out proper supervision. In this way, it is expected to promote rural economic development. In the past, farmers obtain funds mainly from normal financial institutions like banks. The amount and convenience of available funds are limited and impede farmers' obtaining agricultural production funds and consequently restricts agricultural economic growth. Therefore, it is recommended to properly develop informal financial institutions, such as rural private financing and fund raising, and properly supervise operation and development of funds, to facilitate agricultural production of farmers, invigorate rural financial develop-

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ity fresh fruit for customers, adjust supply of products in dull and busy seasons, extend the industrial chain, increase added value of products, improve quality of Gauri Gvong *Phyllanthus embica* Linn, increase income and ability of planting farmers.

4.7 Establishing fine brand of Gauri Gvong *Phyllanthus embica* Linn and extending the market

It is recommended to actively carry out geographical identification and origin certification trade mark certification of Gauri Gvong *Phyllanthus embica* Linn, protect and strengthen variety resources of Gauri Gvong *Phyllanthus embica* Linn, and enhance the intellectual property right protection of Gauri Gvong *Phyllanthus embica* Linn. It is recommended to combine tourism development of Gauri Gvong, fully explore ecological and cultural resources of Gauri Gvong

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ment, promote rural economic development, and so as to guide development of rural finance.

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Phyllanthus embica Linn, build ecological, cultural and tourism brands of Gauri Gvong *Phyllanthus embica* Linn, extend market, and enrich tourism culture and tourist industry of Gauri Gvong.

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