

Geographical Indications and Regional Public Brands of the Whole Rice Industry Chain in the Yangtze River Economic Belt

Min ZHANG, Li GAO, Dongjing LI*, Juncheng ZHU, Bin HU

Research Center of Beidou + Industrial Development of Key Research Institute of Humanities and Social Sciences of Hubei Province, Hubei University of Science and Technology, Xianning 437100, China

Abstract The Yangtze River Economic Belt is the main rice producing area in China. The rice industry chain is the agricultural pillar industry chain of this economic belt and it is the key to ensuring national food security and promoting comprehensive rural revitalization. This study discusses the entire rice industry chain in the Yangtze River Economic Belt from the national rice production functional zones, agricultural product quality and safety, national famous and excellent new agricultural products, national specialty agricultural products, "China's good grain and oil" products, and national advantageous characteristic industrial clusters. Then, it discusses the geographical indications of rice and its products in this economic belt from geographical indication products, geographical indication trademarks, agricultural geographical indications, geographical indication standards, geographical indication special indications, national geographical indication product protection demonstration zones, and Chinese geographical indication products protected by the European Union. In addition, it analyzes the five main problems between geographical indications and public brands, such as the limited use of geographical indication specific signs and the imperfect intellectual property protection system for geographical indications. Finally, it proposes eight strategies, including promoting the high-quality development of the entire rice industry chain, creating a geographical indication regional public brand for rice and its products, and implementing geographical indication protection projects.

Key words Yangtze River Economic Belt, Rice and its products, Entire industry chain, Geographical indication, Regional public brand

0 Introduction

Promoting the development of the Yangtze River Economic Belt^[1–3], coordinated development with the construction of the "Belt and Road" and the Beijing-Tianjin-Hebei region, is the "three major regional development strategies" implemented in the new era". On November 27, 2023, the Political Bureau of CPC Central Committee deliberated and approved the *Opinions on Several Policies and Measures to Further Promote the High-quality Development of the Yangtze River Economic Belt*. The Yangtze River Economic Belt spans the eastern, central and western regions of China, including Shanghai, Jiangsu, Zhejiang, Anhui and Jiangxi in East China, Hubei and Hunan in Central China, and Chongqing, Sichuan, Guizhou and Yunnan in Southwest China. It is the main rice producing area in China. The rice industry chain is the pillar of the agricultural industry chain in the economic belt, and it is the key to ensuring national food security and promoting comprehensive rural revitalization.

Geographical indication (GI) refers to a sign indicating that a commodity originates from a certain region, and that the specific quality, reputation or other characteristics of the commodity are mainly determined by the natural or human factors of the region^[4–5]. It is an intellectual property right for specialty prod-

ucts^[6–9], has an important function of cultivating regional public goods brands, and is a brand logo intellectual property right^[5]. In order to create a number of key products for the protection of geographical indications, strengthen the leading drive, and promote the further improvement of the geographical indication protection system, the Office of China National Intellectual Property Administration officially issued the *Implementation Plan for the Protection of Geographical Indications* on January 22, 2024. In this context, we explored the strategies of geographical indication protection and regional public brand building for the whole rice industry chain in the Yangtze River Economic Belt.

1 Whole rice industry chain

To set up the concept of big agriculture, we need to strengthen the integration of primary, secondary and tertiary industries, adhere to the concept of integrity, innovation and system, and focus on the high-quality development of the whole rice industry chain in the Yangtze River Economic Belt. The whole rice industry chain is an organic whole of R & D, production, processing, storage and transportation, sales, brand, experience, consumption, service and other links and subjects closely linked, effectively linked, coupled and coordinated development, including the front, middle, and tail ends. Its front end covers land consolidation, construction of high-standard paddy fields and optimization of national rice production functional areas, implementation of modern rice seed industry upgrading project, and the complete planting process of rice from sowing, field management to harvesting. The middle end involves post-production services, including transportation and storage, primary processing of rice, and intensive processing of rice, such as the production of rice flour, rice noo-

Received: November 12, 2024 Accepted: January 4, 2025

Supported by Social Science Foundation of Hubei Province (HBSKJJ20243227), Doctoral Initiation Project of Hubei University of Science and Technology (BK201819).

Min ZHANG, associate professor, master, research fields: traditional culture and famous specialties.

* Corresponding author. Dongjing LI, associate professor, PhD., research fields: agricultural machinery and mechanization.

dles, rice cakes, rice wine, rice oil, vinegar, rice wine, liquor brewing, and the preparation of medicinal liquor. The tail end focuses on the brand building and marketing of rice and its products, scientific and technological research and development and technology promotion, the inheritance of rice culture, and the development of tourism products.

1.1 National rice production function area Rice is the staple food in China, especially in the Yangtze River Economic Belt. The State Council issued the *Guiding Opinions on the Establishment of Functional Areas for Food Production and Protected Areas for Important Agricultural Products Production* (Guofa [2017] 24), and deployed the establishment of three functional areas for grain production, namely, rice, wheat and corn, and five protected areas for the production of important agricultural products, namely, soybean, cotton, rapeseed, sugar cane and natural rubber. The rice production function area of 226.67 ha was determined to focus on the Northeast Plain, the Yangtze River Basin and the southeast coastal areas. There are 1.456 7 million ha of National rice production function area in Yangtze River Economic Belt, accounting for 64.26% of the total in the whole country. Among them, Shanghai is 53 333 300 ha, Jiangsu is 213 300 ha,

Zhejiang is 53 300 ha, Anhui is 186 700 ha, Jiangxi is 186 700 ha, Hubei is 166 700 ha, Hunan is 256 700 ha, Chongqing is 50 000 ha, Sichuan is 184 700 ha, Guizhou is 53 300 ha and Yunnan is 100 000 ha.

1.2 Quality and safety of agricultural products The quality and safety of agricultural products is the key to the high-quality development of agriculture. In the past, China's food safety certification was mainly "three products" certification, namely, pollution-free agricultural products certification, green food certification and organic food certification. The Ministry of Agriculture and Rural Affairs has cancelled the certification of pollution-free agricultural products and replaced it with the certification of edible agricultural products.

There are many green food and organic food certification agencies in China. According to China Green Food Development Center, there are 6 803 and 66 valid green food certificates for Yangtze River Economic Belt rice and rice wine (fermented glutinous rice), and the annual output of green food is 9 165 560 t and 64 080 t, respectively, involving 3 502 and 27 market entities, respectively (Table 1).

Table 1 Green food certification of Yangtze River Economic Belt rice and rice wine

Province	Rice			Rice wine (fermented glutinous rice)		
	Q'ty of certificates	Annual output //10 ³ t	Number of market entities	Q'ty of certificates	Annual output //10 ³ t	Number of market entities
Shanghai	373	294.89	341			
Jiangsu	2 612	4 016.77	1 402	7	2.08	5
Zhejiang	151	61.44	137			
Anhui	1 529	2 362.98	696			
Jiangxi	646	686.47	208			
Hubei	462	721.27	241	57	59.00	21
Hunan	641	765.68	285			
Chongqing	113	27.42	57			
Sichuan	112	150.93	71	2	3.00	1
Guizhou	49	19.17	32			
Yunnan	115	58.54	32			
Total	6 803	9 165.56	3 502	66	64.08	27

In the Yangtze River Economic Belt, there are 103 national standardized production bases of green food raw materials related to rice. Among them, there are two national standardized production bases for green food raw materials (rice and rape): Wujiang District, Suzhou City, Jiangsu Province, and Nanxian County, Hunan Province.

There are 28 national standardized production bases for green food raw materials (rice and wheat): Jiangning District of Nanjing City, Jiangsu Province, Tongshan District of Xuzhou City, Huaiyin District of Huai'an City, Suyu District of Suqian City, Kunshan City, Gaoyou City, Suining County, Peixian County, Guanyun County, Donghai County, Sihong County, Siyang County and Shuyang County; Dongxin Branch, Huanghai Branch, Gangbu Branch, Baoying Lake Branch, Fuxingwei Branch, Binhuai Branch, Linhai Branch, Xinyang Branch, Xincao Branch, Ganggang Branch, Jiangxinsha Branch, Yuntai Branch, Baima Lake Branch,

Huaihai Branch and Dongbatou Branch of Jiangsu Agricultural Group.

There are 73 standardized production bases of green food raw materials (rice) in China: Jinshan District and Chongming District of Shanghai; Lishui District, Gaochun District, Xinyi City, Xuyi County, Sheyang County, Jianhu County and Baoying County of Nanjing City in Jiangsu Province; Yixiu District of Anqing City, Yu'an District of Lu'an City, Jin'an District, Nanqiao District of Chuzhou City, Fanchang District of Wuhu City, Wanli District, Xuanzhou District of Xuancheng City, Guangde City, Tongcheng City, Qianjiang County, Zongyang County, Wangjiang County, Dongzhi County, Huaining County, Hexian County, Nanling County, Huoqiu County, Shucheng County, Feixi County, Huayanghe Farm of Anhui Agricultural Reclamation Group in Anhui Province; Xiangdong District of Pingxiang City, Guangxin District of Shangrao City, Dexing City, Guixi City, Poyang County, Xingguo County, Nanchang County, Yifeng County, Fengxin County,

Shanggao County, Wanzai County, Jing'an County, Xiushui County, Lianhua County, Duchang County, Luxi County and Zhuhu Farm in Jiangxi Province; Jianli City, Jingshan City, Qianjiang City, Yingcheng City and Yicheng City in Hubei Province; Yuanjiang City, Shaodong County, Xiangtan County, Pingjiang County, Yueyang County, Linli County, Qiyang County, Li County, Hengnan County, Suining County and Jianghua Yao Autonomous County in Hunan Province; Pidu District of Chengdu City, Zhao-hua District of Guangyuan City, Anju District of Suining City, Qionglai City, Xichang City, Anyue County, Jiange County, Cangxi County, Fushun County, Changning County and Yilong County in Sichuan Province.

1.3 National famous, special, excellent and new agricultural products National famous, special, excellent and new agricultural products are an important brand of rice and its products. According to *Directory Collection Login Information System National Famous, Special, Excellent and New Agricultural Products* of the Ministry of Agriculture and Rural Affairs, the Yangtze River Economic Belt has 111 kinds of rice National famous, special, excellent and new agricultural products.

Among them, there are five kinds of rice in Shanghai: Minhang rice, Jinze rice, Luoqing rice, Waigang rice and Chongming rice, with a total production scale of 6 889 ha; 23 kinds of rice in Jiangsu Province: Changshu Rice, Changshu Yaxuenuo Rice, Changyinsha Rice, Dianshan Lake Rice, Fangqiao Rice, Fengxian Rice, Guliwu Rice, Haian Rice, Haiyu Rice, Huzhuang Rice, Huangjing Rice, Shaxi Rice, Shanghu Rice, Suken Baoying Lake Rice, Suken Dongxin Rice, Suken Huanghai Rice, Suken Port Rice, Suken Linhai Rice, Suken Nantong Rice, Suken Xincao Rice, Suzhou Rice, Xiangcheng Rice and Yanghe Rice, with a total production scale of 125 601 ha; two kinds of rice in Zhejiang Province: Wuhe selenium-rich rice and Qingtian rice-fish rice, with a total production scale of 3 978 ha; 25 kinds of rice in Anhui Province: Bowang rice, Chaohu Rice, Feidong Rice, Feixi Rice, Hanshan Rice, Huaiyuan Rlutinous Rice, Huoqiu shrimp field rice, Huoqiu Ratooning rice, Jin'an Rice shrimp rice, Jingde Rice, Lujiang Rice, Madian Glutinous Rice, Shitai selenium Rice, Tongcheng Rice, Tongcheng Fengliang Youxiang No. 1 rice, Wanzhi Ratooning rice, Wangjiang rice, Wuwei glutinous rice, Wuhu Rice, Wuhe Rice, Xiaji glutinous rice, Yixiu Rice, Yixiu red rice, Yuhui Rice and Yu'an Rice, with a total production scale of 658 535 ha; 20 kinds of rice in Jiangxi Province: Anyuan Rice, Chongyi Terrace Rice, Dayu Simiao Fragrant Rice, Duchang Rice, Fengcheng Rice, Fuliang Rice, Hukou Liumi Rice, Jishui Rice, Jinggang Red Rice, Jinggangshan Rice, Lianhua Rice, Magu Rice, Nankang Rice, Shangyou Rice, Shicheng Tribute Rice, Suichuan Rice, Wan'an Selenium-rich Rice, Wannian Tribute Rice, Xinggan Yahe Tribute Rice, Yujiang Fragrant Rice. Its total production scale is 66 196 ha.

There are two kinds of rice in Hubei Province: Yellow Plum Fragrant Rice, Zhijiang Mamao Rice, with a total production scale 52 000 ha; two kinds of rice in Hunan Province: Nanxian rice-shrimp rice, Yongshun Rice, with a total production scale of 49 333 ha; 8 kinds of rice in Chongqing: Banan Fragrant Rice,

Mala Lake Tribute Rice, Nanchuan Rice, Pengshui Miaoxiang Rice, Shizhu Rice, Wushan Longgupo Rice, Youyang Tribute Rice and Zhongxian Dongpo Yinmi, with a total production scale of 43 885 ha; 13 kinds of rice in Sichuan: Dachuan Tribute Rice, Daan Rice, Hanyuan Rice, Jiange Tribute Rice, Jintang Rice, Jingyang Mid-season Rice, Longchang Fish Rice, Neijiang Tiancheng Flavor Rice, Tongjiang Rice, Wangjia Tribute Rice, Weiuyan Qionglong Rice, Yuechi Rice and Zizhong Xiwang Fragrant Rice, with a total production scale of 94 836 ha; 7 kinds of rice in Guizhou: Gaoniang Rice, Luodian Rice, Meitan Maoba Rice, Pinglang Rice, Sandu Rice, Shibing Zhuguang Rice and Yinjiang Rice, with a total production scale of 24 046 ha; 4 kinds of rice in Yunnan: Dali Erhai Rice, Longjiang Red Soft Rice, Ninglang Plateau Red Rice and Zhanyi Rice, with a total production scale of 4 974 ha.

In addition, there are also 8 kinds of rice products in the economic belt, national famous, special, excellent and new agricultural products: Jinggang rice noodles, Yuechi rice noodles, Longyou steamed sponge cake, Yiyang rice cake, Ningdu Hakka rice wine, Wuyuan rice wine, Chongren Anshi glutinous rice wine, Lianhua Old Liquor (Table 2).

1.4 National special agricultural products National special agricultural product is an important brand of rice and its products. Since 2021, the Quality and Safety Center of Ministry of Agriculture and Rural Affairs identified 10 kinds of national special agricultural products for rice and its products in the Yangtze River Economic Belt: Suken Haoming Rice, Muma Lake Rice, Haoxiang Rice, Jinzhai Yingshanhong Mountain Rice, Shezhou Fragrant Rice, Neijiang Daqianggu Fragrant Rice, Zhangantun Soft Fragrant Rice, Yunzhigu Xiaohuang Glutinous Rice, Yunxiong Colorful Rice Noodles, and Suken Jiangxinsha Rice Oil (Table 3).

1.5 "China's Good Grain and Oil" Products "China's good grain and oil" is an important part of China's high-quality grain and oil project. China Grain and Oil Society selected the latest two batches of "China's good grain and oil" products in 2021 and 2022. Among them, there are 91 kinds of rice oil and rice products in the Yangtze River Economic Belt. Among them, there are two kinds of rice health oil: Anhui Ranlong brand rice oil and Jiangxi Xianglu brand rice oil.

There are 21 kinds of japonica rice: Shanghai Guangming Rice Brand Haifeng High-quality Rice; Jiangsu Xiaoteal Brand Xiaoshuiya Refined Japonica Rice, Suhong Brand Yixiang Rice, Quxing Brand Quxing Rice, Suken Brand Haomingnan Japonic Rice 46, Xieyuan Brand Xieyuan Rice, Jihe Brand Yushan Rice, Xianren Brand Xianrengong Rice, Longyuan Brand Late Japonica Rice; Zhejiang Fuyicang Brand Fuyicang No. 1 Rice; Anhui Huaxiang Brand Fragrant Japonica Rice, Luoluo Brand Luoluo Rice (Fragrant Japonica Rice), Muma Lake Brand Organic Japonica Rice, Baihu Brand Fragrant Soft Rice, Liushouyuan Brand Rice, Jinhewan Brand Germ Rice, Ruifulin Brand Organic Rice, Xin'an Brand Chaohu Renjia Pearl Rice, Fulinmen Brand Pearl Fragrant Rice; Hubei Qiumusitian Brand Qiumusitian Ecological Fragrant

Table 2 Rice products of national famous, special, excellent and new agricultural products in the Yangtze River Economic Belt

Province	Product name	Certified unit	Product scale	Main production entities
Zhejiang	Longyou steamed sponge cake	Longyou County Bureau of Agriculture and Rural Affairs	12 000.0 t	Zhejiang Shan Steaming Workshop Co. , Ltd.
Jiangxi	Jinggang water-milled rice noodles	Ji'an Agricultural Product Quality and Safety Testing Center	775.0 ha	Yongxin Cereals, Oils and Foodstuffs Co. , Ltd. and Ji'an Xinjun Biotechnology Co. , Ltd.
	Yiyang rice cake	Yiyang County Agricultural and Rural Industry Development Service Center	134.7 ha	Yiyang County Dangu Rendao Food Co. , Ltd. and Jiangxi Province Ali Laobiao Trading Co. Ltd.
	Ningdu Hakka rice wine	Ningdu County Bureau of Agriculture and Rural Affairs	318.0 ha	Jiangxi Cuiwei Sanjia Wine Co. , Ltd. and Ningdu County Gucun Town Shanquan Sanjia Liquor Brewing Co. , Ltd.
	Wuyuan rice wine	Wuyuan County Bureau of Agriculture and Rural Affairs	4 850.0 t	Wuyuan Chaji Wine Shop, Jiangxi Wuyuan Laoshui Liquor Co. , Ltd. , and Wuyuan Beautiful Village Wine Shop
	Chongren Anshi glutinous rice wine	Chongren County Bureau of Agriculture and Rural Affairs	500.0 ha	Jiangxi Anshifang Wine Co. , Ltd.
	Lianhua Old Liquor	Lianhua County Bureau of Agriculture and Rural Affairs	55.0 ha	Lianhua County Huangyishan Maolin Agricultural Development Co. , Ltd. , Lianhua County Lukang Specialized Breeding Cooperative, Lianhua County Liangfang Yunxiu Wine Factory, Lianhua County Liansheng Liquor Brewing Factory
Sichuan	Yuechi rice noodles	Yuechi County Bureau of Agriculture and Rural Affairs	40 000.0 t	Sichuan Yinfeng Food Co. , Ltd. , Sichuan Huyou Green Food Co. , Ltd. , Sichuan Powder Master Food Co. , Ltd.

Table 3 Rice and its products of national special agricultural products in the Yangtze River Economic Belt

Province	Product name	Certified unit	Production scale
Jiangsu	Suken Haoming Rice	Suken Cereals Industry	666.0 ha
	Suken Jiangxinsha Rice Oil	Jiangxinsha Branch of Jiangsu Agricultural Reclamation Agricultural Development Co. , Ltd.	1 000.0 ha
Anhui	Muma Lake Rice	Anhui Muma Lake Agricultural Development Group Co. , Ltd.	170.0 ha
	Jinzhai Yingshanhong Mountain Rice	Jinzhai County Yingshanhong Agricultural Development Co. , Ltd.	30.0 ha
	Shezhou Fragrant Rice	Shexian County Zhaofeng Family Farm	100.0 ha
Sichuan	Neijiang Daqiangu Fragrant Rice	Neijiang Feilong Rice Co. , Ltd.	2 030.0 ha
Yunnan	Haoxiang Rice	Yunnan Xiye Agricultural Development Co. , Ltd.	45.0 ha
	Zhangantun Soft Fragrant Rice	Jinfengyuan Family Farm in Malong District	340.0 ha
	Yunzhigu Xiaohuang Glutinous Rice	Luoping County Yunzhigu Rice Planting Farmers' Specialized Cooperative	150.0 ha
	Yunxiong Colorful Rice Noodles	Shizong Yunxiong Industrial Co. , Ltd	5 000.0 t

Rice; Yunnan Kunliang Brand Caiyunzhanin Fragrant Rice. There are 68 kinds of indica rice; Anhui Guojing Brand Soft Fragrant Rice and Fragrant Rice, Jiaxian Brand Yueya Rice, Lifeng Brand Yitang Fragrant Rice, Tianxia Yitang Brand Futang Fragrant Rice, Lianhe Brand Xiyangyang Pure Rice, Fengpeiuyan Brand Shrimp Rice Soft Fragrant Rice, Jiangbei Wanjian Brand Changjian Rice Shrimp Rice, Lvfu Brand Lufu Rice Changlixiang, Zinan Brand Nanling Rice, Xiuxiuxiang Brand Guli 99 Ecological Fragrant Rice, Pihe Brand Xinyuan Rice and Shrimp Rice, Baojiawan Hongri Brand Baolaoer Fragrant Rice, Kangying Brand Rice, Golden Olive Brand Simiao Rice; Jiangxi Poyang Lake Brand Poyang Lake Shrimp Rice Fragrant Rice, Jinjia Brand Jiate Indica Rice, Tiangong Brand Tiangong Rice Waiyin No.7, Fulinmen Brand Fulinmen Simiao Rice, Wannian Gong Brand Hongyun Wannian Tribute Rice, Magu Brand Magu Rice, Jinjia Brand Zhutai Fragrant Rice; Hubei Wanlian Brand Lianxiang Selenium Jade Fragrant Rice (Selenium-rich), Shike Brand Shike Rice King (Rice), Guofu Brand Guofu Soft Fragrant Rice, Guobaoqiao Rice Brand Guobaoqiao Rice, De'anfu Brand Organic Fragrant Rice, Hongsen Brand Hongsen and Hongsen Fragrant Rice, Hua-

yuan Brand Shrimp Rice Fragrant Rice, Jinghe 100 Brand Jinghe 100 Selenium-rich Rice, Erdumei Brand Foyuan Rice and Huangmei Sticky Rice, Chuhuaxiang Brand Suizhou Fragrant Rice, Jingchu Tiantianwang Brand Jingchu Tiantianwang Rice, Jishan Rice Brand Jishan Rice, Shrimp Township Rice Brand Shrimp Township Rice Fragrant Rice, Yangtze River Greenbelt Brand Greenbelt Fragrant Rice, Zhuangpinjian Brand Shijiahe Tucheng Zhenmi (Rice) and Huangxiaohuigong Xiangqiao Rice, Xiangzishen Brand Soft Fragrant Simiao Rice, Huamao Brand Nanzhangguan Rice, Shuixiang Shrimp Rice Brand Shuixiang Shrimp Rice Ecological Fragrant Kelewa Brand Fragrant rice, Xianyuan Brand Xianyuan 100% Fragrant rice, Jinyonglong Brand Jinyonglong Long Grain Fragrant Rice; Hunan Jinzhixiang Brand Nanxian Rice, Jiwa Hutian Brand Jiwa Tribute Rice, Yaozhen Brand Lengquanzhen Fragrant Rice, Lvtaijian Brand Daoxiang Shrimp Rice and Nanxian Rice Shrimp Rice, Hecangxiang Brand Jiahe Selenium-rich Rice, Jinjian Brand Jinjian Fragrant Rice and Star No.2 Rice, Shijiantang Brand Changde Fragrant Rice, Shiwaitaoyuan Fragrance Brand Selenium-rich Natural Fragrant Rice and Changde Fragrant Rice, Fulinmen Brand Natural Fragrant Splen

Royal Granary Jinhualuxi Wetland Brand Oil Sticky Rice; Chongqing Heavy Grain Brand Organic Hengshan Tribute Rice; Sichuan Lixiang Brand Fragrant Rice, Changchi Jade Rice Brand Fish and Rice Symbiotic Rural Small Rice (Indica Rice), Nuoshui Brand Tongjiang Rice, Liangjiashan Brand Fragrant Rice, Furuixi Brand Shuzhong Rice Fragrant Rice; Guizhou Gaofeng Shilixiang Brand Rice, Haoyu Brand Pingba Fragrant Rice; Yunnan Babaogong Brand Babao Runkou Type Tribute Rice.

1.6 National advantageous and characteristic industrial clusters

The development of industrial clusters is the new productive force of agriculture and rural areas^[10]. The effects of industrial agglomeration include economies of scale, external economic effects, regional division of labor and specialization effects, knowledge spillover effects, industrial innovation effects, cost saving effects, agglomeration and diffusion effects, competitiveness improvement effects, resource allocation optimization effects, international trade effects, *etc.* The Ministry of Agriculture and Rural Affairs and Ministry of Finance launched the national advantageous and characteristic in 2020. The construction of industrial clusters has listed 220 construction lists in five batches so far. Among them, there are 7 projects involving Yangtze River Economic Belt rice: Jiangsu rice industrial cluster, Anhui Wuhu rice industrial cluster, Anhui glutinous rice industrial cluster along the Huaihe River, Jiangxi Poyang Lake rice industrial cluster, Hubei rice industrial cluster, Hunan Dongting fragrant rice industrial cluster and Chongqing rice industrial cluster.

2 Geographical indications of rice and its products

2.1 Geographical indication products The protection of geographical indication products is a special protection mode of intellectual property rights of geographical indications. According to the approval announcements of the former State Administration for Market Regulation and China National Intellectual Property Administration for the protection of geographical indications over the years, Yangtze River Economic Belt has 104 kinds of geographical indication products of rice and its products. Except Chongqing, such geographical indication products are distributed in 10 other provinces and cities.

Among them, there are two kinds in Shanghai: Songjiang Rice and Chongming Old Liquor; 8 kinds of rice in Jiangsu: Heng Rice, Donghai Rice, Sheyang Rice, Xinghua Rice, Funing Rice Cake, Zhenjiang Vinegar, Rugao Rice Wine and Yanghe Daqu; 3 kinds in Zhejiang: Longyou steamed sponge cake, Shaoxing wine and Yandongguan Wujiapi wine; 10 kinds in Anhui: Nanling Rice, Bailianpo Tribute Rice, Huaining Tribute Cake, Nanfeng Yellow Rice Wine, Wucheng rice wine, Sanhe Rice Wine, Xuanjiu Wine, Yingjia Tribute Liquor, Kouzijiao Wine and Gaolujia Wine; 8 kinds in Jiangxi: Wannian Tribute Rice, Fengcheng Selenium-Rich Rice, Huichang Rice Noodles, Yiyang Rice Cake, Fengcheng Frozen Rice Candy, Chongyi South Wild Jujube Cake, Wanzainan Wild Jujube Cake, Lidu Wine; 18 kinds in Hubei: Jingshanqiao Rice, Fasi Rice, Taizi Rice, Jishanlong Rice, Qichunzhen Rice, Xuan'en Tribute Rice, Guanmiaoshan Tribute Rice, Zhuxi Tribute Rice, Yingcheng Glutinous Rice,

Zhuhu Glutinous Rice, Qichun Sour Rice Noodles, Muzidian Old Rice Wine (Dongshan Old Rice Wine, Dongmu Old Rice Wine), Fangxian Yellow Rice Wine, Huangmei Duihua Wine, Luyangqiao Fenggang Wine, Jianli Grain Wine, Guquan Qingjiu Wine; 7 kinds in Hunan: Xinhuang Dongzang Red Rice, Miluo Zongzi, Changle Sweet Wine, Yongfeng Thick Chilli Sauce, Xidu Lake Wine, Jiugui Wine and Deshan Daqu; 25 kinds in Sichuan: Micheng Rice, Yilong Dashan Fragrant Rice, Changchi Jade Rice, Huanglong Tribute Rice, Wangjia Tribute Rice, Danling Frozen Rice Cake, Renshou Sesame Cake, Emei Cake, Suji Rice Candy, Pujiang Rice Candy, Dongliu Fermented Glutinous Rice, Taiyuan Well Vinegar, Baoning Pressing Wine, Jiannanchun Wine, Zhixi Yuye (Pengshan Tequ), Qiong Wine, Yibin Wine, Wangsi Liquor, Jiangkou Alcohol Wine, Chongyang Wine, Luzhou Wine Shuijingfang Liquor, Wuliangye, Shede Liquor, Sichuan Liquor (Golden Triangle of Chinese Liquor); 17 kinds in Guizhou: Bide Rice, Danzhai Selenium-Zinc Rice, Mao Tribute Rice, Xiligong Rice, Baiguo Tribute Rice, Panzhou Red Rice, Liping Xianghe Glutinous Rice, Huishui Black Glutinous Rice, Xingyi Bait Cake, Qingzhen Yellow Cake, Zhenningbo Sugar, Yumo Vinegar, Chishui Sun-Dried Vinegar, Kaili Red Sour Soup, Huangguoshu Cellar Wine, Yaxi Cellar Wine And Huishui Black Glutinous Rice Wine; 6 kinds in Yunnan: Guangnan Babao Rice, Zhefang Tribute Rice, Mojiang Purple Rice, Lufeng Vinegar, Miaoba Liquor, Heqing Royal Wine.

2.2 Geographical indication trademarks The trademark protection of geographical indications is the trademark protection mode of intellectual property rights of geographical indications, including collective trademarks of geographical indications and certification trademarks of geographical indications. Yangtze River Economic Belt has registered 216 geographical indication trademarks of rice and its products, according to *China Trademark Network Electronic Bulletin System* of China National Intellectual Property Administration.

Among them, there are two geographical indication trademarks in Shanghai: Chongming Rice and Songjiang Rice. Jiangsu Province has 49 geographical indication trademarks: Baoying Rice, Binhai Rice, Changshu Rice, Changyinsha Rice, Dafeng Rice, Donghai Rice, Dongtai Rice, Funing Rice, Haian Rice, Hongze Rice, Huaiyin Rice, Jiangyan Rice, Jinhu Rice, Jurong Daizhuang Rice, Lishui Rice, Peixian Rice, Rongbing Rice, Rudong Rice, Shenwei Rice, Sihong Rice, Suining Rice, Xinyi Rice, Taicang Rice, Wuzhong Rice, Xinghua Rice, Yandu Guomeng Rice, Yangxiang Rice, Huaian Rice (Registration No. : 4970200; 4970201), Jianhu Rice (Registration No. : 6151600; 11530536), Zhouxiang Rice, Yancheng Rice, Jianhu Shrimp Rice, Gandaili Rice, Suining Indica Rice, Golden Village Soft Rice (Registration No. : 35676953; 39469622), Xuyi Lobster Fragrant Rice (Registration No. : 34372510; 63057225), Zaohe Tribute Rice, Zengxinde Rice, Yancheng Rice Seed, Changshu Yaxue Glutinous Rice, Funing Cake, Dongtai Tangerine Peel Wine, Zhenjiang Vinegar (Registration No. : 4488806; 6771159). Zhejiang Province has 18 geographical indication trademarks: Dongqiao Rice, Qingtian Rice, Jiaxing Zongzi, Xiangshan Rice Steamed Bun, Xiangshan Maci, Xinchang Fried Rice Cake, Xin-

chang Rice Cake, Yuyao Glutinous Rice Cake, Zhangjiayi Glutinous Rice Cake, Cicheng Glutinous Rice Cake, Longyou Steamed Sponge Cake, Dongyang Red Yeast Wine, Shaoxing Rice Wine (registration number 1388983; 7475908), Shaoxing Old Liquor, Jiashan Old Liquor (Registration No.: 4461563; 4461564), Zhoushan Red Bayberry Liquor. Anhui Province has 18 geographical indication trademarks: Fengyang Rice, Guxihe Rice, Hanshan Rice, Huangqingxu Rice, Huoqiu Rice, Nanling Rice, Tianchang Rice, Tianzhuang Rice, Wuhu Rice, Yingshang Rice (Registration No.: 12626103; 10379899), Huoqiu Xiatian Rice, Jinzhai Mountain Rice, Jiagou Fragrant Rice (Registration No.: 214 80734), Huaiyuan Glutinous Rice, Huaining Tribute Cake, and Qianshan Glutinous Rice Sealed Jar Wine. Jiangxi Province has 14 geographical indication trademarks: Jinggangshan Rice, Lichuan Rice, Nancheng Magu Rice, Yongxiu Fragrant Rice, Shicheng Tribute Rice, Xinggan Yahe Tribute Rice, Anyi Rice Noodle, Luocheng Zhafen, Yiyang Rice Cake, Longnan Hakka Rice Wine, Lepinggu Wine, Jishui Winter Wine, Jiujiang Fenggang Wine and Nancheng Magu Wine.

Hubei Province has 39 geographical indication trademarks: Jingshanqiao Rice, Jingshan Rice, Songzi Rice, Zhangtiansi Rice, Zhongxiang Rice, Luhudang Rice, Fasi Rice, Fairy Rice, Xiangyang Rice, Xiaochang Taizi Rice, Jishan Rice, Yicheng Rice, Jianglingdao Rice, Zhouwan Fragrant Rice, Qichunzhen Rice, Xiantao Fragrant Rice, Xiaogan Fragrant Rice, Nanzhang Official Rice, Xuan'en Tribute Rice, Zhuxi Tribute Rice, Suizhou Fragrant Rice, Qianjiang Shrimp Rice, Bajiao Fragrant Rice (Registration No.: 13833912; 14229281), Baiyi Rice (Registration No.: 10831615; 21456037), Wudu Yingxian Rice (Registration No.: 13833911; 14229282), Shixi Wuzi Rice (Registration No.: 60460784; 64317872), Honghu Sankecun Glutinous Rice, Yingcheng Glutinous Rice, Wuxue Crisp Sugar, Qianjiang Rice Tea, Zhongxiang Rice Tea, Muzidian Old Rice Wine, Xiaogan Rice Wine, Fangxian Yellow Rice Wine, Zaobei Yellow Rice Wine. Hunan Province has 19 geographical indication trademarks: Anren Rice, Datonghu Rice, Nanxian Rice, Yueyang Rice, Changde Fragrant Rice, Nanxian Rice and Shrimp, Nanzhou Rice and Shrimp, Yuquangong Rice, Zilagong Rice, Huarong Rice, Xinhua Red Rice, Changde Rice Noodles, Jinshi Beef Rice Noodles, Youxian Rice Noodles, Miluo Zongzi, Fenghuang Duck Blood Rice, Tongdao Bitter Wine, Xinhua Glutinous Rice Wine and Changle Sweet Wine.

Chongqing has 14 geographical indication trademarks: Fengdu Chestnut Rice, Fengyangou Rice, Hengshan Rice, Pengshui Turtle Pond Rice, Shitan Rice, Wanzhou Luotian Rice, Hechuan Fengshan Rice, Nanchuan Tribute Rice, Tongnan Luopanshan Tribute Rice, Youyang Tribute Rice, Hechuan Longfeng Mountain Rice, Songzhao Healthy Vinegar, Dianjiang Za Wine and Pengshui Five-step Snake Wine. Sichuan Province has 22 geographical indication trademarks: Tianfu Dongpo Rice, Dechang Fragrant Rice, Huangxi Tribute Rice, Jitian Tribute Rice, Kaijiang Tribute Rice, Yuechi Huanglong Tribute Rice, Shikong Tribute Rice, Nanjiang Feicui Rice, Xuanhan Taohua Rice, Puge Plateau Japonica Rice (Registration No.: 19201643; 46750403), Mianyang Rice Seed, Fresh Rice Noodles, Yuechi Rice Noodles, Pu-

jiang Rice Candy, Junlian Tongziye Paoba, Danling Frozen Cake, Changning Cool Cake, Renshou Sesame Cake, Jiulongzhen Liquor, Nanxi Liquor, Yibin Liquor. Guizhou 6 pieces: Huishui Rice, Hongjiang Rice, Chazhai Tribute Rice, Xifeng Xishan Tribute Rice, Kaili Sour Soup, Chishui Sun-dried Vinegar. Yunnan Province has 15 geographical indications trademarks: Luoping Rice, Menghai Fragrant Rice, Pantiange Black Grain Rice, Yuanjiang Yangjie Rice, Dehong Fragrant Soft Rice (registration number 11319551; 11568316), Mojiang Purple Rice, Jiangcheng Yaojiashan Red Rice, Yuanyang Terrace Red Rice, Shizong Heier Glutinous Rice, Sunset Fragrant Glutinous Rice, Mengzi Crossing Bridge Rice Noodles (registration number 7374667; 8357860), Tengehong Ersi Rice Snack, Mengzi Rice Cake.

2.3 Geographical indications (GI) of agricultural products

The Ministry of Agriculture and Rural Affairs has decided to stop the registration of geographical indications of agricultural products since November 17, 2022. According to the National Information Query System for Agricultural Products with Geographical Indications, the Ministry of Agriculture and Rural Affairs (formerly Ministry of Agriculture) has registered a total of 77 geographical indications of rice agricultural products in Yangtze River Economic Belt. In addition to Zhejiang, the geographical indications of such agricultural products are distributed in 10 other provinces and cities.

Among them, Shanghai has one GI agricultural product: Qingpu Thin Rice; Jiangsu Province has 8 GI agricultural products: Sihong Rice, Sheyang Rice, Gaoxu Rice, Jiangyan Rice, Dongtai Rice, Tuqiao Rice, Chahe Rice and Suqian Indica Rice, Anhui Province has 8 kinds of GI agricultural products: Nanling Rice, Hanshan Rice, Wuhu Rice, Yingshang Rice, Bailianpo Tribute Rice, Fengyang Tribute Rice, Dianji Tribute Rice And Madian Glutinous Rice; Jiangxi Province has Province has 9 kinds of GI agricultural products: Fengxin Rice, Gaoan Rice, Yichun Rice, Poyang Rice, Duchang Rice, Fuliang Rice, Magu Rice, Lichuan Rice and Jinggang Red Rice. Hubei Province has 18 kinds of GI agricultural products: Jianli Rice, Zhongxiang Changshou Village Rice, Shuizhuyuan Rice, Zhizheping Rice, Pinglin Town Rice, Wacang Rice, Shimacao Rice, Xiehuaqiao Rice, Xiaogan Fragrant Rice, Hulutan Tribute Rice, Chengen Tribute Rice, Jinzhuangyan Tribute Rice, Donggong Official Rice, Xiaogan Glutinous Rice, Yunyang Yanzhi Rice, Fangxian Lengshui Red Rice, Honghu Ratooning Rice and Qichun Ratooning Rice. Hunan Province has 11 kinds of GI agricultural products: Yuanjiang Rice, Datonghu Rice, Heshan Lanxi Rice, Songhai Rice, Chengtoushan Rice, Changde Fragrant Rice, Jiangyong Fragrant Rice, Ziquejie Tribute Rice, Wushan Tribute Rice, Baiyun Tribute Rice, Huarong Rice. Chongqing has 3 kinds of GI agricultural products: Wanzhou Luotian Rice, Nanchuan Rice, Mala Lake Tribute Rice. Sichuan Province has 4 kinds of GI agricultural products: Longxing Rice, Xuanhan Taohua Rice, Qianwei Ratooning Rice and Fushun Ratooning Rice. Guizhou Province has 13 kinds of GI agricultural products: Pingba Rice, Dushan Rice, Maoba Rice, Gangcun Rice, Baishui Tribute Rice, Hailong Tribute Rice, Jinzhu Tribute Rice, Xifeng Xishan Tribute Rice, Yachuan Tribute Rice, Kaili Pingliang Tribute Rice, Guo-

jiawan Tribute Rice, Congjiang Xianghe Glutinous Rice, Huishui Black Glutinous Rice. Yunan Province has 2 kinds of GI agricultural products: Guangan Babao Rice and Ninglang Plateau Red Rice.

2.4 GI standard GI standard is the basis for the standardization of geographical indications and specialties. There are four general national standards for geographical indications in China, namely, GB/T 44584-2024 *Basic Terminology of Geographical Indications*, GB/T 43583-2023 *Classification and Code of Geographical Indications Identified Products*, GB/T 36678-2018 *Regional Brand Value Evaluation of Geographical Indications Products*, GB/T 17924-2008 *General Requirements for Geographical Indications Product Standards* and one general agricultural industry standard for geographical indications, NY/T 3606-2020 *Technical Specification for Quality Identification and Quality Control of Geographical Indications of Agricultural Products*.

As mentioned above, Yangtze River Economic Belt rice and its products have 104 geographical indication products, 216 geographical indication trademarks, and 272 geographical indication specialties (excluding duplicates). According to the National Standard Information Public Service Platform of the State Administration for Market Regulation and the National Standardization Management Committee, there are 11 national standards for geographical indication products and 60 provincial local standards. However, 187 kinds of products without national and local standards of geographical indications accounted for 68.75%, and 85 kinds of products with national or local standards of geographical indications accounted for 31.25%.

There are no national standards for geographical indications for three specialties in Shanghai, and there are provincial local standards for Songjiang Rice and Chongming Old Liquor. However, there is no local standard for geographical indication products in Chongming Rice.

Jiangsu Province has 47 geographical indications specialties, including 2 national standards GB/T 18623-2011 *Zhenjiang Vinegar* and GB/T 22046-2008 *Yanghe Daqu Liquor*, and 5 provincial local standards: Heheng Rice, Sheyang Rice, Xinghua Rice, Donghai Rice and Funing Cake, and one kind has the municipal level local standard: Yancheng Rice. However, there is no national and local standards for 39 GI products: Dongtai Rice, Jurong Daizhuang Rice, Taicang Rice, Jiangyan Rice, Jinhu Rice, Rudong Rice, Funing Rice, Jianhu Rice, Baoying Rice, Binhai Rice, Changshu Rice, Hongze Rice, Huaiyin Rice, Changyinsha Rice, Lishui Rice, Peixian Rice, Rongbing Rice, Sihong Rice, Suining Rice, Shenwei Rice, Xinyi Rice, Yangxiang Rice, Zhouxiang Rice, Yandu Guomeng Rice, Dafeng Rice, Haian Rice, Huaian Rice, Wuzhong Rice, Golden Village Soft Rice, Suining Indica Rice, Jianhu Shrimp Rice, Xuyi Lobster Fragrant Rice, Zengxinde Rice, Gandaili Rice, Yancheng Rice Seed, Zaohe Gong Rice, Changshu Duck Blood Glutinous Rice, Rugao Yellow Wine, and Dongtai Chenpi Wine.

Jiangsu Province has 15 geographical indications specialties, including 2 national standards GB/T 17946-2008 *Geographical Indication Product Shaoxing Wine (Shaoxing Yellow Wine)* and GB/T 21821-2008 *Geographical Indication Product Yandongguan*

Wujiapi Wine. However, there are no national or local standards for 13 kinds of geographical indication products: Dongqiao Rice, Qingtian Rice, Xiangshan Maci, Xiangshan Rice Steamed Bun, Jiaying Zongzi, Longyou Steamed Sponge Cake, Cicheng Rice Cake, Yuyao Rice Cake, Xinchang Rice Cake (Xinchang Fried Rice Cake), Zhangjiayi Rice Cake, Jiashan Old Liquor, Dongyang Red Koji Wine and Zhoushan Red Bayberry Wine.

Anhui Province has 25 geographical indications specialties, one national standard GB/T 19328-2007 *Geographical Indication Product Kouzijiao Liquor*, Nanling Rice, Bailianpo Tribute Rice, Huaining Tribute Cake, Wucheng Rice Wine, Sanhe Rice Wine, Nanfeng Yellow Wine, Gaolujia Liquor, Xuanjiu Liquor and Yingjia Tribute Liquor have provincial local standards. However, there are no national and local standards for 15 kinds of geographical indication products: Tianzhuang Rice, Hanshan Rice, Yingshang Rice, Guxihe Rice, Yingshang Rice, Fengyang Rice, Huangqingwei Rice, Wuhu Rice, Huoqiu Rice, Tianchang Rice, Jinzhai Mountain Rice, Huoqiu Xiantian Rice, Huaiyuan Glutinous Rice, Jiagou Fragrant Rice, Qianshan Glutinous Rice Sealed Jar Wine.

Jiangxi Province has 21 kinds of geographical indications specialties, but there are no specific national standards for geographical indications. There are 8 kinds of provincial local standards for Fengcheng Selenium-rich Rice, Wannian Tribute Rice, Huichang Rice Noodles, Fengcheng Frozen Rice Sugar, Yiyang rice cake, Chongyi South Jujube Cake, Wanzai South Jujube Cake and Lidu Wine. However, there are no national and local standards for 13 kinds of geographical indication products: Jinggangshan Rice, Shicheng Tribute Rice, Lichuan Limi, Yongxiu Fragrant Rice, Nancheng Magu Rice, Xinggan Yahe Tribute Rice, Anyi Rice Noodles, Luocheng Zhafen, Longnan Hakka Rice Wine, Nancheng Magu Liquor, Jishui Winter Liquor, Jiujiang Fenggang Wine and Lepinggu Wine.

Hubei Province has 43 geographical indications specialties, but there is no national standard for geographical indications. Jingshanqiao Rice (Jingshan Rice), Taizi Rice (Xiaochang Taizi Rice), Zhuxi Tribute Rice, Xuan'en Tribute Rice, Yingcheng Glutinous Rice, Qichunzhen Rice, Zhuhu Glutinous Rice, Wuxue Crisp Sugar, Fangxian Yellow Wine, Jianli Grain Wine, Guquan Sake, Huangmei Duihua Wine, Luyangqiao Fenggang Wine and Wudang Wine have provincial local standards, and Xiaogan Fragrant Rice has municipal local standards. However, there are no national and local standards for 28 kinds of geographical indication products: Luhudang Rice, Zhongxiang Rice, Songzi Rice, Fairy Rice, Xiangyang Rice, Zhangtiansi Rice, Fasi Rice, Guanmiaoshangong Rice, Jishanlong Rice, Jianglingdao Rice, Shixi Wuzi Rice, Xiantao Fragrant Rice, Jishan Rice, Nanzhangguan Rice, Zhouwan Fragrant Rice, Yicheng Rice, Qianjiang Shrimp Rice, Suizhou Fragrant Rice, Baiyi Rice, Wudu Yingxian Rice, Honghu Three Inch Glutinous Rice, Bajiao Fragrant Rice, Qianjiang Rice Tea, Zhongxiang Rice Tea, Qichun Sour Rice Noodles, Xiaogan Rice Wine, Muzidian Old Rice Wine, Zaobei Yellow Rice Wine.

Hunan Province has 23 kinds of geographical indications specialties, including one national standard GB/T 22736-2008 *Geographical Indication Product Jiugui Liquor*, and four provincial lo-

cal standards: Xinhuang Dong Xizangan Red Rice (Xinhuang Red Rice), Miluo Zongzi, Xidu Lake Liquor and Deshan Daqu. However, there are no national and local standards for 18 kinds of geographical indication products: Yueyang Rice, Anren Rice, Datonghu Rice, Nanxian Rice, Changde Fragrant Rice, Nanxian Shrimp Rice, Nanzhou Shrimp Rice, Yuquan Tribute Rice, Zila Tribute Rice, Huarong Rice, Jinshi Beef Rice Noodles, Changde Rice Noodles, Youxian Rice Noodles, Yongfeng Hot Sauce, Xinhua Glutinous Rice Water Wine, Fenghuang Blood Duck, Tongdao Bitter Wine, Changle Sweet Wine. There are 14 kinds of geographical indications specialties in Chongqing, and there are no national standards for geographical indications and local standards for geographical indications products. Hengshan Rice, Shitan Rice, Pengshui Guichi Rice, Fengyangou Rice, Fengdu Chestnut Rice, Wanzhou Luotian Rice, Hechuan Fengshan Rice, Hechuan Longfengshan Rice, Nanchuan Tribute Rice, Tongnan Luopanshan Tribute Rice, Youyang Tribute Rice, Songzhao Healthy Vinegar, Dianjiang Za Wine, Pengshui Five-step Snake Wine.

Sichuan Province has 42 kinds of geographical indications and five national standards GB/T 22211-2008 *Geographical Indication Product Wuliangye Liquor*, GB/T 22045-2008 *Geographical Indication Product Luzhou Laojiao Tequ Liquor*, GB/T 21820-2008 *Geographical Indication Product Shede Liquor*, GB/T 18624-2007 *Geographical Indication Product Shuijingfang Liquor*, GB/T 19961-2005 *Geographical Indication Product Jiannanchun Liquor*, and two provincial local standards: *Sichuan Liquor (Golden Triangle of Chinese Liquor)* and *Pujiang Rice Candy*. Micheng Rice, Yilongdashaan Fragrant Rice, Huanglong Tribute Rice, Wangjia Tribute Rice, Danling Frozen Cake, Emei Cake, Qiongjiu, Chongyang Liquor, Jiangkou Alcohol Liquor and Yibin Liquor have municipal local standards. However, there are no national and local standards for 25 kinds of geographical indication products: Tianfu Dongpo Rice, Dechang Fragrant Rice, Nanjiang Jade Rice, Changchi Jade Rice, Xuanhan Peach Blossom Rice, Huangxi Tribute Rice, Shikong Tribute Rice, Yuechi Huanglong Tribute Rice, Jitian Tribute Rice, Kaijiang Tribute Rice, Puge Plateau Japonica Rice, Mianyang Rice Seed, Huaxian Rice Noodles, Yuechi Rice Noodles, Renshou Sesame Cake, Changning Cold Cake, Junlian Tongziye Paoba, Suji Rice Candy, Dongliu Fermented Glutinous Rice, Taiyuan Well Vinegar, Baoning Pressing Liquor, Jiulongzhen Liquor, Nanxi Liquor, Wangsi Liquor, Zhixi Yuye (Pengshan Tequ Liquor).

There are 21 kinds of geographical indications in Guizhou Province, and there is no national standard for geographical indications. Panzhou Red Rice, Danzhai Selenium-Zinc Rice, Xili Tribute Rice, Mao Tribute Rice, Baiguo Tribute Rice, Liping Xianghe Glutinous Rice, Huishui Black Glutinous Rice, Kaili Red Sour Soup (Kaili Sour Soup), Chishui Sun-dried Vinegar, Yaxi Pit Wine, a total of 10 kinds have provincial local standards, Qingzhen Huangba has city-level local standards. However, there are no national and local standards for 10 kinds of geographical indication products: Bide Rice, Huishui Rice, Hongjiang Rice, Xifeng Xishan Tribute Rice, Chazhai Tribute Rice, Xingyi Baobaiba, Zhenningbo Sugar, Yumo Vinegar, Huishui Black Glutinous Rice Wine and Huangguoshu Cellar Wine.

There are 18 kinds of geographical indications in Yunnan Province, and there is no national standard for geographical indications. Guangan Babao Rice, Mojiang Purple Rice, Zhefang Tribute Rice, Lufeng Vinegar, Miaoba Liquor and Heqing Royal Wine have provincial local standards, and Menghai Fragrant Rice has municipal local standards. However, there are no national and local standards for 11 kinds of geographical indication products: Luoping Rice, Pantiange Black Valley Rice, Yuanjiang Yangjie Rice, yuanyang Terrace Red Rice, Jiangcheng Yaojiashan Red Rice, Dehong Fragrant Soft Rice, Shizong Heier Glutinous Rice, Sunset Fragrant Glutinous Rice, Tengchong Ersi Rice Snack, Mengzi Crossing Bridge Rice Noodles and Mengzi Rice Cake.

2.5 Special GI marks The use of special GI marks is the key to build regional public goods brand and give full play to the function of geographical indications brand. As mentioned above, rice and its products in Yangtze River Economic Belt have 103 kinds of geographical indication products, 216 geographical indication trademarks, and 280 kinds of special GI marks (not counting duplicates). According to China National Intellectual Property Administration's *Information Retrieval of Enterprises Using Special Marks for Geographical Indications*, 109 of these special GI marks are not used by market entities, accounting for 38.93%, and 171 have been used by market entities. 61.07%. There are 1069 market entities using these special GI marks, including 990 leading enterprises, 53 professional cooperatives, 25 family farms and one natural person.

As shown in Table 4, the number of market entities using 171 special GI marks ranges from 1 to 74. Among them, 68 kinds of special GI marks have only one market entity: Jurong Daizhuang Rice, Taicang Rice, Yancheng Rice, Xuyi Shrimp Fragrant Rice, Dongtai Rice, Yanghe Daqu in Jiangsu; Yuyao Rice Cake in Zhejiang Province; Guxihe Rice, Yingshang Rice Qianshan Glutinous Rice Fenggang Liquor, Nanfeng Yellow Rice Wine, Gaolujia Liquor, Kouzijiao Liquor, Xuanjiu Liquor, and Yingjia Tribute Liquor in Anhui Province; Chongyinan Wild Jujube Cake, Wanzainan Wild Jujube Cake, Lepinggu Wine, Lidu Liquor in Jiangxi Province; Jishan Rice, Nanzhang Official Rice, Zhouwan Fragrant Rice, Zhuhu Glutinous Rice, Baiyi Rice, Zhongxiang Rice Tea, Qichun Sour Rice Noodles, Guquan Sake, Huangmei Duihua Wine, Luyangqiao Fenggang Wine, Wudang Wine in Hubei Province; Xinhuang Red Rice, Huarong Rice, Changle Sweet Wine, Deshan Daqu, Jiugui Liquor in Hunan Province; Pengshui Guichi Rice, Fengyangou Rice, Hechuan Fengshan Rice in Chongqing; Micheng Rice, Yilong Dashaan Fragrant Rice, Nanjiang Jade Rice, Changchi Jade Rice, Huangxi Tribute Rice, Shikong Tribute Rice, Yuechi Huanglong Tribute Rice, Changning Cool Cake, Danling Frozen Cake, Junlian Tongziye Paoba, Taiyuan Well Sun-dried Vinegar, Baoning Pressing Wine, Chongyang Wine, Wuliangye, Jiannanchun Wine, Jiangkou Alcohol Wine, Shuijingfang Wine, Yibin Wine in Sichuan Province; Danzhai Selenium-zinc Rice, Xiligong Rice, Mao Tribute Rice, Kaili Red Sour Soup, Yumo Vinegar and Yaxi cellar Wine in Guizhou Province; Luoping Rice, Menghai Fragrant Rice, Yuanjiang Yangjie Rice, Yuanyang Terrace Red Rice, Mengzi Rice Cake and Heqing Royal Wine in Yunnan Province.

Table 4 Statistics on the use of special GI marks for rice and its product in Yangtze River Economic Belt

Number of market entities	Number of GI	GI
74	1	Yellow Rice Wine from Fangxian County in Hubei Province
61	1	Sheyang Rice from Jiangsu Province
56	1	Jingshan Bridge Rice from Hubei Province
52	1	Funing Big Cake from Jiangsu Province
34	1	Luzhou Wine from Sichuan Province
32	1	Jingshan Rice from Hubei Province
30	3	Zhenjiang Aromatic Vinegar from Jiangsu Province; Xiaogan Rice Wine from Hubei Province; Changde Fragrant Rice from Hunan Province
27	1	Dafeng Rice from Jiangsu Province
24	1	Xiantao Fragrant Rice from Hubei Province
22	1	Haian Rice from Jiangsu Province
20	1	Huoqiu Rice from Anhui Province
19	5	Xinghua Rice and Huaian Rice from Jiangsu Province; Jiaxing Zongzi from Zhejiang Province; Yicheng Rice from Hubei Province; Nanxian County Rice from Hunan Province
18	2	Songjiang Rice from Shanghai; Shaoxing Wine from Zhejiang Province
17	1	Chongming Rice from Shanghai
13	2	Qianjiang Rice from Hubei Province; Nanxian Rice from Hunan Province
12	4	Tianchang Rice and Huaining Tribute Cake from Anhui Province; Jinggangshan rice from Jiangxi; Qiongjiu Wine from Sichuan Province
11	4	Longyou Steamed Sponge Cake from Zhejiang Province; Bailianpo Tribute Rice and Huoqiu Shrimp Field Rice from Anhui Province; Bobo Sugar from Zhenning in Guizhou Province
10	2	Muzidian Rice Wine from Hubei Province; Nanzhou Shrimp Rice from Hunan Province
9	5	Wuzhong Rice and Zhenjiang Vinegar from Jiangsu Province; Wannian Tribute Rice from Jiangxi Province; Luhudang Rice from Hubei Province; Jinshi Beef Rice Noodles from Hunan Province
8	1	Changde Rice Noodles from Hunan Province
7	10	Chongming Old Liquor from Shanghai; Rudong Rice from Jiangsu Province; Fengcheng Frozen Rice Candy and Yiyang Rice Cake from Jiangxi Province; Xiaogan Fragrant Rice, Yingcheng Glutinous Rice and Xiaochang Taizi Rice from Hubei Province; Yongfeng Chili Sauce and Xinhua Glutinous Rice Liquor from Hunan Province; Chishui Sun-dried Vinegar from Guizhou Province
6	6	Funing Rice from Jiangsu Province; Nanling Rice from Anhui Province; Fengcheng Selenium-Rich Rice from Jiangxi Province; Qichunzhen Rice and Suizhou Fragrant Rice from Hubei Province; Yuechi Rice Noodles from Sichuan Province
5	4	Jianhu Rice from Jiangsu Province; Tianzhuang Rice from Anhui Province; Youxian Rice Noodles from Hunan Province; Pujiang Rice Candy from Sichuan Province
4	8	Donghai Rice from Jiangsu Province; Hanshan Rice, Yingshang Rice, Huaiyuan Glutinous Rice and Wucheng Rice Wine from Anhui Province; Cicheng Rice Cake from Zhejiang Province; Xuanhan Peach Blossom Rice from Sichuan Province; Mengzi Cross-Bridge Rice Noodles from Yunnan Province
3	17	Huangjincun Soft Rice, Suining Indica Rice and Rugao Rice Wine from Jiangsu Province; Jiagou Fragrant Rice from Anhui Province; Qingtian Rice-Fish Rice, Shaoxing Rice Wine and Yandongguan Wujiapi Wine from Zhejiang Province; Shicheng Gong Rice from Jiangxi Province; Taizi Rice, Zhuxi Tribute Rice and Xuan'en Tribute Rice from Hubei Province; Hengshan Rice from Chongqing; Wangjia Tribute Rice, Emei Cake and Renshou Sesame Cake from Sichuan Province; Qingzhen Huangba from Guizhou Province; Mojiang Purple Rice from Yunnan Province
2	19	Jiangyan Rice, Jinhu Rice and Jianhu Shrimp Rice from Jiangsu Province; Dongqiao Rice, Shaoxing Old Liquor and Dongyang Red Koji Wine from Zhejiang Province; Sanhe Rice Wine from Anhui Province; Zhongxiang Rice and Wuxue Crisp Sugar from Hubei Province; Yueyang Rice and Miluo Zongzi from Hunan Province; Shitan Rice from Chongqing; Wangsi Liquor from Sichuan Province; Liping Xianghe Glutinous Rice, Panzhou Red Rice, Ginkgo Tribute Rice and Huishui Black Glutinous Rice Wine from Guizhou Province; Zhefang Tribute Rice and Lufeng Vinegar from Yunnan Province
1	68	There are 67 geographical indications in Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Chongqing, Sichuan, Guizhou and Yunnan provinces and cities.

Shanghai has three kinds of special GI marks: Songjiang Rice, Chongming Rice, and Chongming Old Liquor (Table 4). There are 42 market entities, including 26 leading enterprises and 16 professional entities.

Jiangsu Province has 48 kinds of special GI marks. However,

23 kinds are still not used by any market entity: Baoying Rice, Binhai Rice, Changshu Rice, Heheng Rice, Hongze Rice, Huaiyin Rice, Changyinsha Rice, Lishui Rice, Peixian Rice, Rongbing Rice, Sihong Rice, Suining Rice, Shenwei Rice, Xinyi Rice, Yangxiang Rice, Zhouxiang Rice, Yandu Guomeng Rice, Zengxinde

Rice, Gandaili Rice, Yancheng Rice Seed, Zaohe Tribute Rice, Changshu Duck Blood Glutinous Rice, Dongtai Tangerine Peel Wine. 25 kinds of special GI marks have been used: Sheyang Rice, Funing Cake, Zhenjiang Vinegar, Dafeng Rice, Haian Rice, Xinghua Rice, Huaian Rice, Wuzhong Rice, Zhenjiang Vinegar, Rudong Rice, Funing Rice, Jianhu Rice, Donghai Rice, Huangjincun Soft Rice, Suining Indica Rice, Rugao Yellow Rice, Jiangyan Rice, Jinhu Rice, Jianhu Shrimp Rice, Jurong Daizhuang Rice, Taicang Rice, Yancheng Rice, Xuyi Shrimp Rice, Dongtai Rice and Yanghe Daqu Liquor (Table 4). There are 278 market entities, including 252 leading enterprises, 7 professional cooperatives and 19 family farms.

Zhejiang Province has 18 kinds of special GI marks. However, 7 kinds are still not used by any market entity: Xiangshan Maci, Xiangshan Rice Steamed Bun, Xinchang Fried Rice Cake, Xinchang Rice Cake, Zhangjiayi Rice Cake, Jiashan Old Liquor, Zhoushan Red Bayberry Liquor. 11 kinds of special GI marks have been used: Jiaying Zongzi, Shaoxing Wine, Longyou Steamed Sponge Cake, Cicheng Rice Cake, Qingtian Rice-Fish-Rice, Shaoxing Rice Wine, Yandongguan Wujiapi Wine, Dongqiao Rice, Shaoxing Old Liquor, Dongyang Red Yeast Wine, and Yuyao Rice Cake (Table 4). There are 66 market entities, including 64 leading enterprises, one professional cooperative and one family farm.

Anhui Province has 25 kinds of special GI marks. However, 4 kinds are still not used by any market entity: Fengyang Rice, Huangqingwei Rice, Wuhu Rice, Jinzhai Mountain Rice; 21 kinds of special GI marks have been used: Huoqiu Rice, Tianchang Rice, Huaining Tribute Cake, Bailianpo Tribute Rice, Huoqiu Xiantian Rice, Nanling Rice, Tianzhuang Rice, Hanshan Rice, Yingshang Rice, Huaiyuan Glutinous Rice, Wucheng rice wine, Jiagou Fragrant Rice, Sanhe rice wine, Guxihe Rice, Yingshang Rice, Qianshan Glutinous Rice Fenggang Liquor, Nanfeng Yellow Rice Wine, Gaolujia Liquor, Kouzijiao Liquor, Xuanjiu Liquor, Yingjia Tribute Liquor. There are 97 market entities, including 87 leading enterprises, 6 professional cooperatives and 4 family farms.

Jiangxi Province has 11 kinds of special GI marks. However, 11 kinds are still not used by any market entity: Lichuan Rice, Yongxiu Fragrant Rice, Nancheng Magu Rice, Xinggan Yahe Tribute Rice, Huichang Rice Noodles, Anyi Rice Noodles, Luocheng Rice Noodles, Longnan Hakka Rice Wine, Nancheng Magu Wine, Jishui Winter Wine, Jiujiang Fenggang Wine; 10 kinds of special GI marks have been used: Jinggangshan Rice, Wannian Tribute Rice, Fengcheng Frozen Rice Candy, Yiyang Rice Cake, Fengcheng Selenium-rich Rice, Shicheng Tribute Rice, Chongyi South Wild Jujube Cake, Wanzai South Wild Jujube Cake, Lepinggu Wine and Lidu Wine (Table 4). There are 48 market entities, including 46 leading enterprises, and 2 professional cooperatives.

Hubei Province has 45 kinds of special GI marks. However, 15 kinds are still not used by any market entity: Songzi Rice, Fairy Rice, Xiangyang Rice, Zhangtiansi Rice, Fasi Rice, Guan-

miaoshan Tribute Rice, Jishanlong Rice, Jianglingdao Rice, Shixi Wuzi Rice, Wudu Yingxian Rice, Honghu Sankecun Glutinous Rice, Bajiao Fragrant Rice, Qianjiang Rice Tea, Zaobei Yellow Wine, Jianli Grain Wine; 30 kinds of special GI marks have been used: Fangxian Yellow Wine, Jingshan Bridge Rice, Jingshan Rice, Xiaogan Rice Wine, Xiantao Fragrant Rice, Yicheng Rice, Qianjiang Shrimp Rice, Muzidian Old Rice Wine, Luhuang Rice, Xiaogan Fragrant Rice, Yingcheng Glutinous Rice, Xiaochang Prince Rice, Qichun Zhenmi, Suizhou Fragrant Rice, Prince Rice, Zhuxi Tribute Rice, Xuanen Tribute Rice, Zhongxiang Rice, Wuxue Crisp Sugar, Jishan Rice, Nanzhang Official Rice, Zhouwan Fragrant Rice, Zhuhu Glutinous Rice Zhongxiang Rice Tea, Qichun Sour Rice Noodles, Guquan Sake, Huangmei Duihua Wine, Luyangqiao Fenggang Wine and Wudang Wine (Table 4). There are 291 market entities, including 279 leading enterprises, 10 professional cooperatives, one family farm, and one natural person.

Hubei Province has 24 kinds of special GI marks. However, 8 kinds are still not used by any market entity: Anren Rice, Datong Lake Rice, Xinhuang Dongzang Red Rice, Yuquan Tribute Rice, Zila Tribute Rice, Fenghuang Blood Duck, Tongdao Bitter Wine, Xidu Lake Wine; 16 kinds of special GI marks have been used: Changde Fragrant Rice, Nanxian Rice, Nanxian Shrimp Rice, Nanzhou Shrimp Rice, Jinshi Beef Rice Noodles, Changde Rice Noodles, Yongfeng Hot Sauce, Xinhua Glutinous Rice Wine, Youxian Rice Noodles, Yueyang Rice, Miluo Zongzi, Xinhuang Red Rice, Huarong Rice, Changle Sweet Wine, Deshan Daqu and Jiugui Liquor (Table 4). There are 96 market entities, including 89 leading enterprises and 7 professional cooperatives.

Chongqing has 14 kinds of special GI marks. However, 9 kinds are still not used by any market entity: Fengdu Chestnut Rice, Wanzhou Luotian Rice, Hechuan Longfeng Mountain Rice, Nanchuan Tribute Rice, Tongnan Luopanshan Tribute Rice, Youyang Tribute Rice, Songzhao Healthy Vinegar, Dianjiang Za Wine and Pengshui Five-step Snake Wine; 5 kinds of special GI marks have been used: Hengshan Rice, Pengshui Turtle Pond Rice, Shitan Rice, Hechuan Fengshan Rice (Table 4). There are 8 market entities, including 6 leading enterprises and 2 professional cooperatives.

Sichuan Province has 42 kinds of special GI marks. However, 16 kinds are still not used by any market entity: Tianfu Dongpo Rice, Dechang Fragrant Rice, Huanglong Tribute Rice, Jitian Tribute Rice, Kaijiang Tribute Rice, Puge Plateau Japonica Rice, Mianyang Rice Seed, Huaxian Rice Noodles, Suji Rice Candy, Dongliu Fermented Glutinous Rice, Jiulongzhen Liquor, Nanxi Liquor, Sichuan Liquor (Golden Triangle of Chinese Liquor), and Shede Liquor; 27 kinds of special GI marks have been used: Luzhou Liquor, Qiongyu Liquor, Yuechi Rice Noodles, Pujiang Rice Candy, Xuanhan Peach Blossom Rice, Wangjia Tribute Rice, Emei Cake, Renshou Sesame Cake, Wangsi Liquor, Micheng Rice, Yilong Dashan Rice, Nanjiang Jade Rice, Changchi Jade Rice, Huangxi Tribute Rice, Shikong Tribute Rice, Yue-

chi Huanglong Gongmi, Changning Cold Cake, Danleng Dongba, Junlian Tongziye Paoba, Taiyuan Well Vinegar, Baoning Pressing Liquor, Chongyang Liquor, Wuliangye, Jiannanchun Liquor, Jiangkou Liquor, Shuijingfang Liquor and Yibin Liquor (Table 4). There are 90 market entities, including 89 leading enterprises and one professional cooperative.

Guizhou Province has 22 kinds of special GI marks. However, 9 kinds are still not used by any market entity: Bide Rice, Huishui Rice, Hongjiang Rice, Xifeng Xishan Tribute Rice, Chazhai Tribute Rice, Huishui Black Glutinous Rice, Xingyi Bait Cake, Kaili Sour Soup, Huangguoshu Cellar Wine; 13 kinds of special GI marks have been used: Zhenning Bobo Sugar, Chishui Sun-Dried Vinegar, Qingzhen Huangba, Liping Xianghe Glutinous Rice, Panzhou Red Rice, Baiguo Tribute Rice, Huishui Black Glutinous Rice Wine, Danzhai Selenium-Zinc Rice, Xili Tribute Rice, Mao Tribute Rice, Kaili Red Sour Soup, Yumo Vinegar, Yaxi Cellar Wine (Table 4). There are 35 market entities, including 34 leading enterprises and one professional cooperative.

Yunan Province has 18 kinds of special GI marks. However, 8 kinds are still not used by any market entity: Pantianghe Black Grain Rice, Jiangcheng Yaojiashan Red Rice, Guangnan Babao Rice, Dehong Fragrant Soft Rice, Shizong Heier Glutinous Rice, Sunset Fragrant Glutinous Rice, Tengchong Ersi Rice Snack, and Miaoba Liquor; 10 kinds of special GI marks have been used: Mengzi Cross-Bridge Rice Noodles, Mojiang Purple Rice, Zhefang Tribute Rice, Lufeng Vinegar, Luoping Rice, Menghai Fragrant Rice, Yuanjiang Yangjie Rice, Yuanyang Terrace Red Rice, Mengzi Rice Cake, Heqing Royal Wine (Table 4). There are 17 market entities, and all are leading enterprises.

2.6 National geographic indication product protection demonstration zone National geographic indication product protection demonstration zone has the function of leading the whole chain of creation, application, protection, management and service of intellectual property rights of geographical indications. China National Intellectual Property Administration has confirmed the list of 79 national demonstration zones for the protection of geographical indication products. Among, there are five geographical indications involving Yangtze River Economic Belt rice and its products: Songjiang Rice National Geographical Indication Product Protection Demonstration Zone, Jingshanqiao Rice National Geographical Indication Product Protection Demonstration Zone, Zhenjiang Vinegar National Geographical Indication Product Protection Demonstration Zone, Shaoxing Wine National Geographical Indication Product Protection Demonstration Zone, National Geographic Indication Product Protection Demonstration Zone (Chongming, Shanghai).

2.7 Chinese geographical indication products protected by the European Union (EU) The international development of geographical indications helps to build a new development pattern of double cycle. According to the *EU-China Geographical Indications Agreement*, the first batch of 100 Chinese geographical indications products will be protected in the EU, and 175 Chinese ge-

ographical indications products will be protected by the EU in the first four years after the entry into force of the agreement on March 1, 2021. Among these Chinese geographical indication products protected by the EU, there are 13 kinds of Yangtze River Economic Belt rice and its products: Congjiang Xianghe Glutinous Rice, Huichang Rice Noodles, Yongfeng Chili Sauce, Shaoxing Wine, Huishui Black Glutinous Rice Wine, Xiaogan Rice Wine, Yanghe Daqu, Gaolujia Liquor, Gujing Tribute Liquor, Jiugui Wine, Jiannanchun Wine, Luzhou Laojiao Wine and Wuliangye Wine. Among them, Congjiang Xianghe Glutinous Rice is a geographical indication of agricultural products.

3 Main problems of geographical indications and public goods brands

3.1 There are many shortcomings and weak links in the whole industry chain The whole rice industry chain in the Yangtze River Economic Belt has many shortcomings and weak links, such as the promotion project of modern rice seed industry, the inheritance and protection project of rice farming culture, the inheritance and protection project of intangible cultural heritage of rice products, the construction of national rice production function area, national famous, special and excellent products, registration of excellent and new agricultural products and special agricultural products, "China's good grain and oil" project, construction of national advantageous and characteristic industrial clusters, construction of diversified food supply system with rice as the key link, *etc.*

3.2 The quality and safety system needs to be strengthened At present, the certification system of edible agricultural products is mainly tried out in some provinces. There are few green food and organic food certifications in the whole rice industry chain, especially rice noodles, rice cakes, rice wine, rice oil, vinegar, yellow wine, liquor, medicinal liquor and other rice products. There are not many standardized production bases of green food raw materials related to rice in China, and there are no such bases in Zhejiang, Chongqing, Guizhou and Yunnan. The quality and safety traceability management system of rice and its products needs to be established, and the quality and safety system needs to be strengthened.

3.3 The use of special signs for geographical indications is less Based on geographical indication products and geographical indication trademarks, there are 280 special geographical indication marks for rice and its products in the Yangtze River Economic Belt. However, only 13 kinds are used by more than 20 market entities, accounting for 4.64%, 68 kinds are used by only one market entity, accounting for 24.29%, and 109 kinds are not used by any market entity, accounting for 38.93%. The use of special geographical indications is less, which fails to give full play to the cultivation function of regional public goods brand of intellectual property rights of geographical indications.

3.4 The development of geographical indication specialty standardization is lagging behind Among the 272 geographical

indications of rice and its products in the economic belt, there are 11 national standards for geographical indications, 60 provincial local standards and 14 municipal local standards. However, there are 187 kinds of products without national and local standards of geographical indications, accounting for 68.75%, and only 85 kinds of products with national or local standards, accounting for only 31.25%. The standardization of geographical indications is lagging behind.

3.5 The intellectual property protection system of geographical indications is not perfect In the whole rice industry chain of the Yangtze River Economic Belt, many famous and special new products have not yet been protected by the intellectual property rights of geographical indications, especially rice flour, rice noodles, rice cakes, rice wine, rice oil, vinegar, yellow wine, liquor, medicinal liquor and so on. The natural and human factors of geographical indications are not excavated enough. Because the Ministry of Agriculture and Rural Affairs has stopped using the geographical indications of agricultural products, 77 kinds of geographical indications of rice agricultural products originally registered are facing the transfer protection system. The international cooperation of intellectual property rights of geographical indications is not strong, and the whole chain of creation, application, protection, management and service of intellectual property rights of geographical indications is imperfect, especially in the links of application, management and service. Therefore, the intellectual property protection system of geographical indications needs to be improved.

4 Recommendations for the protection of geographical indications and the creation of regional public goods brands

4.1 Improving the intellectual property protection of geographical indications of rice and its products It is recommended to investigate the resources of famous, excellent, special and new rice and their products (rice flour, rice noodles, rice cakes, rice wine, rice oil, aromatic vinegar, yellow wine, liquor, medicinal liquor, etc.) in Yangtze River Economic Belt, and analyze the natural and human factors of their geographical indications, to strive to implement the protection of geographical indication products of China National Intellectual Property Administration. It is necessary to register the geographical indication collective trademark or geographical indication certification trademark of Trademark Office of China National Intellectual Property Administration, enrich the intellectual property resources of geographical indications of whole rice industry chain. It is necessary to register 77 kinds of geographical indications of rice agricultural products originally registered by the Ministry of Agriculture and Rural Affairs, and transfer to the special protection mode of geographical indication products of China National Intellectual Property Administration or Trademark Office of China National Intellectual Property, and the protection mode of geographical indication trademark of Property Administration. It is required to strengthen the manage-

ment and service of intellectual property rights of geographical indications, build a national demonstration zone for the protection of geographical indications products related to the whole rice industry chain, and lead the healthy development of the whole chain of creation, application, protection, management and service of intellectual property rights of geographical indications.

4.2 Promoting the standardization development of whole rice industry chain It is necessary to formulate national standards, provincial local standards or municipal local standards for each geographical indication specialty related to the whole rice industry chain. Besides, it is recommended to standardize the production environment and process, technology, product varieties and specifications, quality classification, test methods, packaging, transportation, storage, agricultural machinery, agricultural materials, analysis and testing, and standardize production. By applying the principle of "unification, simplification, coordination and optimization", the front-end, middle-end and end-end links of the whole rice industry chain are brought into the track of standard production and standard management through the formulation and implementation of standards, so as to promote the standardization development of the whole rice industry chain in the economic belt.

4.3 Improving the quality and safety assurance system of rice and its products The Yangtze River Economic Belt should adhere to the concept of green development, promote the certification of edible agricultural products for rice from, strengthen the certification of green food and organic food for rice and its products, and build a national standardized production base for green food raw materials for rice, rice and wheat, rice and rape, establish the quality and safety traceability management system of rice and its products, improve the quality and safety assurance system, and promote the high-quality development of the food supply side.

4.4 Promoting high-quality development of the whole rice industry chain It is recommended to focus on large-scale leading industries, build standardized raw material bases, develop fine and comprehensive processing, build systematic logistics network, develop brand marketing, promote the whole process of social service, promote green development model, promote digital transformation and upgrading, integrate innovation chains, optimize supply chains, and enhance value chains, build a complete whole rice industry chain and improve the support system, enhance the stability and competitiveness of the whole rice industry chain, and improve the organic whole of R & D, production, processing, storage and transportation, sales, brand, experience, consumption, service and other links and subjects that are closely related, effectively linked, coupled and coordinated. So as to promote the high-quality development of the whole rice industry chain in the economic belt.

4.5 Creating a regional public brand of geographical indications for rice and its products It is recommended to thoroughly analyze the natural and human factors of geographical indications, carry forward and inherit rice farming culture, excavate the cultur-

al connotations of famous and special rice and its products, increase the added value of geographical indications, and encourage leading enterprises, cooperatives, family farms, family workshops and professional individuals to use special geographical indications. Take geographical indications as the key link to integrate the regional public brand of geographical indications of regional brand rice and its products, and give full play to the cultivation function of regional public brand of geographical indications. In addition, it is recommended to strengthen the registration of national famous, special, excellent and new agricultural products, promote the action of "China's good grain and oil", and strengthen brand management and marketing. Create a regional public brand of geographical indication of rice and its products in Yangtze River Economic Belt.

4.6 Strengthening international cooperation on intellectual property rights of geographical indications It is necessary to formulate international standards for relevant geographical indication products and improve the geographical indication protection system for Congjiang Xianghe Glutinous Rice, Huichang Rice Noodles, Yongfeng Chili Sauce, Shaoxing Wine, Huishui Black Glutinous Rice Wine, Xiaogan Rice Wine, Yanghe Daqu, Gaolujia Liquor, Gujing Tribute Wine, Jiugui Wine, Jiannanchun Wine, Luzhou Laojiao Wine and Wuliangye Wine, which will be protected in the EU. The Yangtze River Economic Belt should adhere to the concept of open development, encourage the registration of Madrid's international geographical indications trademarks, strengthen international cooperation in the intellectual property rights of geographical indications, especially rice noodles, rice cakes, rice wine, rice oil, vinegar, yellow wine, liquor, medicinal liquor and other rice products, develop an export-oriented economy, and promote the development of the country, so as to help build a new development pattern of the whole rice industry chain in the economic belt with the domestic cycle as the main body and the domestic and international double cycles promoting each other.

4.7 Building national grain production functional area of rice and national advantageous and characteristic industrial clusters The Yangtze River Economic Belt should raise the awareness of food security, implement the farmland protection system, vigorously promote the construction of rice production functional zones in the Yangtze River Economic Belt, carry out the construction of standardized paddy fields on a large scale, improve the environment of paddy fields, and fully guarantee rice production with the standard of "farmland into square, canal into network, road into frame, and forest into row". It is suggested that leading enterprises, cooperatives, family farms, suppliers, service providers, relevant universities and scientific and technological institutes in the rice industry should be united to form the whole rice industry chain industry alliance in the economic belt. Focus on building Jiangsu rice industry cluster, Anhui Wuhu rice industry

cluster, Anhui glutinous rice industry cluster along the Huaihe River, Jiangxi Poyang Lake rice industry cluster, Hubei rice industry cluster, Hunan Dongting fragrant rice industry cluster, Chongqing rice industrial clusters and other national advantageous and characteristic industrial clusters give full play to the effect of industrial agglomeration.

4.8 Implementing the geographical indication protection project It is suggested that the protection system of geographical indications should be established and perfected, the protection mechanism of geographical indications should be coordinated as a whole, the list of key protected resources of geographical indications should be constructed, the quality assurance control of geographical indications should be strengthened, the protection and supervision of geographical indications should be strengthened, the comprehensive development of geographical indications should be accelerated, and the basic guarantee of geographical indications should be consolidated, and also implement the geographical indication protection project of the whole rice industry chain in the economic belt.

References

- [1] CHENG CC, *et al.* Major strategic research on promoting the development of Yangtze River Economic Belt [M]. Beijing: People's Publishing House, 2021. (in Chinese).
- [2] GAO L, ZHANG JJ, SUN YP, *et al.* Promoting high-quality development of grain and oil in ethnic areas of the Yangtze River Economic Belt from the perspective of agricultural power[J]. *Asian Agricultural Research*, 2024(2): 1–7, 11.
- [3] GAO L, ZHANG JJ, SUN YP, *et al.* Regional brand and high-quality development of fruits in ethnic areas of the Yangtze River Economic Belt under the greater food approach[J]. *Asian Agricultural Research*, 2024(3): 1–7.
- [4] Intellectual Property Press Co., Ltd. Report on the Protection and Development of Geographical Indications (2022) [M]. Beijing: Intellectual Property Press, 2024. (in Chinese).
- [5] GAO L. Hubei's Diversified Food Industry: Innovation and Prosperity Driven by Intellectual Property [M]. Wuhan: Changjiang Publishing House, 2024. (in Chinese).
- [6] GAO L, PENG YM, WU LY, *et al.* Geographical indication intellectual property protection and regional public brand construction of rape industry in China[J]. *Asian Agricultural Research*, 2023, 15(6): 7–13.
- [7] GAO L, SUN YP, ZHANG JJ, *et al.* Intellectual property protection, inheritance, innovation and development of woody edible oilseeds in Hubei Province[J]. *Asian Agricultural Research*, 2023, 15(11): 6–14.
- [8] GAO L, SUN YP, ZENG J, *et al.* Inheritance, innovation and high-quality development of herbaceous edible oils in Hubei Province under the strategy of strengthening the country with intellectual property[J]. *Asian Agricultural Research*, 2023, 15(12): 5–15.
- [9] GAO L, SUN ZG, HE YQ, *et al.* Construction of China osmanthus city and intellectual property right protection in Xianning City in the context of three new developments[J]. *Asian Agricultural Research*, 2022, 14(9): 1–6, 15.
- [10] GAO L, PENG YM, WU LY, *et al.* National protection zone for rape-seed production and industrial cluster of rape in Hubei Province[J]. *Asian Agricultural Research*, 2023, 15(9): 1–10.