

# Rural Households, Dragon Heads and Associations: A Case Study of Sweet Potato Processing in Sichuan Province\*

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**ABSTRACT** In recent years Chinese government policies and research programmes have advocated agricultural industrialization in order to raise demand for farm products, facilitate structural adjustment in agriculture, create rural employment and increase farm incomes. But although agro-industrial activities have become a key feature of China's rural development strategy, the agricultural industrialization policy has been little studied outside China. This article is a case study of the implementation of agricultural industrialization and its impact on rural livelihoods in Sichuan province. It identifies and analyses two major forms of agricultural industrialization: "dragon head enterprises" and "rural associations." Although agro-industrial development is likely to be a critical determinant of China's future social and economic trajectory, the preliminary analysis given here shows a mixed picture. Positive effects include increases in both income and employment. But there is also a negative dimension, shown by the existence of numerous entry barriers, unequal bargaining power and an uneven distribution of benefits.

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In recent years Chinese government policies and research programmes have advocated agricultural industrialization in order to raise demand for agricultural products, facilitate structural adjustment of agriculture, create rural employment and increase the income of farmers. But although agro-industry has therefore become a key feature of China's approach to rural development, the agricultural industrialization policy has been little studied outside China. This article presents a case study of the implementation of agricultural industrialization and its impact on rural development in Sichuan province. It begins by setting the context of recent developments in China's agro-industry. It then introduces Sichuan's sweet potato sector and presents the research methodology. Some preliminary findings are considered: first, I describe the ways in which rural households have become involved with two prominent models of agricultural industrialization (dragon head enterprises and rural associations); secondly, I

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analyse some potential benefits from and constraints on rural household participation. The conclusion indicates the representativeness of the study and highlights areas for further research.

## Recent Approaches to Agricultural Industrialization in China

Agro-industry is defined as a sector that “processes materials of plant or animal origin. Processing involves transformation and preservation through physical or chemical alteration, storage, packaging, and distribution.”<sup>1</sup> In China, this sector has experienced notable developments since 1978.<sup>2</sup> Most significantly in recent years, the Chinese government has started to promote agro-industry as a means of raising demand for farm products, facilitating structural adjustment of agriculture, creating rural employment and increasing the income of farmers.<sup>3</sup> In short, agro-industry is considered “the engine fuelling the development of Chinese agriculture and the main source of farmers’ incomes.”<sup>4</sup>

The government’s main way of encouraging agricultural industrialization is to promote the development of large-scale agro-industry. In 2000, the Ministry of Agriculture and other state entities<sup>5</sup> issued a “policy of supporting key dragon head

- 1 James E. Austin, *Agroindustrial Project Analysis: Critical Design Factors* (Washington, DC: The World Bank, 1992), p. 1. According to China’s statistical classification, agro-processing includes the following 12 industries: food processing, food manufacturing, beverage manufacturing, tobacco processing, textile industry, clothing and other fibre products manufacturing, leather, fur and eiderdown products manufacturing, timber, bamboo, vine, palm fibre and straw processing, furniture manufacturing, paper and paper products industry, the printing and duplication of recording media, and the rubber industry (Du Ying, “Development and policy option for China’s agro-processing sector,” in Organization for Economic Co-operation and Development (OECD) (ed.), *The Agro-Food Processing Sector in China. Developments and Policy Challenges* (Paris: OECD, 2000), pp. 23–24).
- 2 See the various contributions in: OECD (ed.), *The Agro-Food Processing Sector in China* (Paris: OECD, 2000).
- 3 Du Ying, “Development and policy option for China’s agro-processing sector,” pp. 23–44; Zhang Mingpei, “Qieshi ba zhenxing sannong gongzuo de dashi zhuhao” (“Sincerely make efforts to grasp the important work of developing the ‘Three Agricultural’”), *Nongye chanyehua xinxi wang (Agricultural Industrialization News Network)* (2004); Li Ronggen, “Cujin nongye chanyehua jingying zengjia nongmin shouru” (“To promote the agricultural industrialization management to raise farmers’ incomes”), *Agricultural Industrialization News Network* (2004); Deputy Director of the Grain Reserve Bureau, “Opinion: industrialise agriculture,” *China Daily*, 7 February 2002. Many Chinese authors have addressed agricultural industrialization issues in recent years. They include: Ceng Yesong, *Xin nong lun (A Discussion of New Agriculture)* (Beijing: Xinhua chubanshe, 2003); Ding Li, *Nongye chanyehua xinlun (A New Discussion of Agricultural Industrialization)* (Beijing: Zhongguo nongye chubanshe, 2004); Li Yuncai et al., *Zhongguo nongcun xiandaihua yanjiu (Research on China’s Rural Modernization)* (Changsha: Hunan renmin chubanshe, 2005); Mei Hongchang et al., *Lüse shipin chanyehua yanjiu (Research on Green Food Agricultural Industrialization)* (Beijing: Jingji guanli chubanshe, 2004); Wu Qun, *Xin shiqi nongye chanyehua lujing xuanze (The Selection of Methods for Modern Agricultural Industrialization)* (Beijing: Zhongguo nongye chubanshe, 2004); Zhao Deyu and Wen Simei, “Wo guo nongye chanyehua zuzhi de zhili jizhi jiqi xiaolü tezhen” (“The governance mechanism and efficiency of agricultural industrialization organization”), *Zhongguo nongye jingji pinglun (China Agricultural Economic Review)*, Vol. 3, No. 1 (2005), pp. 1–16. For more information on agricultural industrialization in the Chinese literature until 1999 see S. Waldron, *Models of Agro-Industrialization in China: The Case of the Cattle and Beef Industry*, Agricultural and Natural Economics Discussion Paper No. 7 (St. Lucia: School of Natural and Rural Systems Management, University of Queensland, 1999).
- 4 Fu Jing, “Food industry welcomes foreigners,” *China Daily*, 22 August 2002, quoting from a speech by Zhang Guobao, vice-minister of the State Development Planning Commission.
- 5 Namely, the State Development Planning Committee, State Economic and Trade Committee, Ministry of Finance, Ministry of Foreign Trade and Economic Co-operation, People’s Bank of China, State General Bureau of Taxation, China Stock Supervision and Management Committee.

enterprises involved in agricultural industrialization.” Dragon head enterprises (DHEs) are promoted as the “key to agricultural industrialization.” They are considered to be a driving force for market development, technology innovation and farmer organization; in particular, compared with other enterprises, they are said not just to increase the prosperity of the enterprise itself, but also to facilitate improvements in agricultural efficiency, farmers’ income and rural stability.<sup>6</sup>

The policy prescribes more-or-less well-defined criteria for the designation of companies as national DHEs. Key determinants are the attainment of a certain minimum size, stable financial profile, strong market position and technological leadership.<sup>7</sup> Enterprises recognised as DHEs have access to government support, such as preferential tax and loans.<sup>8</sup> There were 151 enterprises in the first group of national DHEs in late 2000. In 2003 this number was increased to 372; by 2004 it reached 582.<sup>9</sup> My interviews revealed that in addition to national DHEs, an unknown number<sup>10</sup> of provincial and county-level DHEs also exist. These latter have to fulfil similar criteria as their national counterparts, although their scale of operation is likely to be smaller. In order to source agricultural raw materials for their industrial-scale production, national and lower-level DHEs have established production chain linkages<sup>11</sup> with rural households. These typically provide the raw materials and often even primary processing for the DHEs.

A second approach towards agricultural industrialization which has received renewed attention by both government and researchers is rural associations.

- 6 Ministry of Agriculture (MOA) *et al.*, *Guanyu fuchi nongye chanyehua jingying zhongdian longtou qiye de yijian. Nongjingfa 2000 8 hao (Policy of Supporting Key Dragon Head Enterprises Involved in Agricultural Industrialization. Agricultural Economic Development, Document No. 8, 2000)* (<http://www.alc.cas.cn/content/html/06/43499.htm>).
- 7 The minimum fixed asset value is 50, 30 and 20 million yuan in eastern, central and western provinces, respectively; the minimum annual sales value for three consecutive years is 200, 100 and 50 million yuan respectively; debt on assets must not exceed 60%; and the enterprise should have a stable credit profile. Its operation must demonstrate high technology and added value; its products must be competitive and have a large market share. The enterprise is further required to have a consistent raw material supply source and to lead (*daidong*) a large (unspecified) number of farmers. Where fixed assets and sales revenue are too small, this can be compensated by strong technological innovation and export performance, as well as import substitution (*ibid.*).
- 8 Ownership of DHEs is unclear. Sometimes they are treated as township and village enterprises (e.g. see Asian Development Bank (ADB), *PRC Agroindustry and Rural Enterprise Development Approaches and Experience* (Manila: ADB, 2000)). Of the DHEs that I encountered, most seemed to be privately owned, but their owners were often former government cadres.
- 9 14 enterprises from the first group failed to fulfil the national DHE criteria in 2003 and were therefore excluded. The total figure for 2004 assumes that all 2003 national DHEs maintained their status. “235 jia qiye ronghuo guojia zhongdian longtou qiye chenghao” (“235 enterprises have the honour of receiving the title of key national dragon head enterprise.”) *Zhongguo nongye xinxi wang (China Agriculture News Network)*, 13 January 2003; MOA *et al.*, *Guanyu gongbu di san pi nongye chanyehua guojia zhongdian longtou qiye mingdan de tongzhi. Nongjingfa 2004 5 hao (Regarding the Announcement of the Third Group of Key National Dragon Head Enterprises Involved in Agricultural Industrialization. Agricultural Economic Development, Document No. 5, 2004)* (<http://www.chinacoop.com/doc/3plt9ymdtz.doc>).
- 10 One source reports that more than 27,000 enterprises had already received DHE status by 2000 (Scott Waldron and Colin Brown, “State sector reform in China: structural considerations in agriculture,” Proceedings of the 15th Annual Conference of the Association for Chinese Economics Studies Australia (ACESA) (2003), pp. 15–16). This figure can only refer to provincial and county level DHEs.
- 11 Production chain linkages refer to the “operational stages that agroindustry materials flow through as they move from the farm through processing and then to the consumer” (Austin, *Agroindustrial Project Analysis*, p. 17). The last part of the production chain, i.e. from final processing through distribution to consumers, will not be dealt with for the purpose of this study.

These are promoted in order to improve farmer integration along the post-harvest chain, and create technology, processing and marketing networks.<sup>12</sup> Despite this, detailed information about rural associations (RAs) – such as their numbers and their legal status<sup>13</sup> – is very limited and unsystematic.<sup>14</sup> Their goal is “to aggregate collective interests to create significant effects for their members, while still being driven by the principles of voluntary participation, self-organization and democratic decision-making.”<sup>15</sup> Typically, RAs engage in farming and livestock activities, and services for their members.<sup>16</sup> My fieldwork suggests, however, that it is very difficult to distinguish “true” RAs from enterprise organizations or government agencies.

My research addresses these recent developments. While agro-industry is advocated as the “new engine of growth”<sup>17</sup> and the key to rural development, its far-reaching implications for rural households have so far largely been neglected. The perceived optimism surrounding DHEs and RAs merits a detailed analysis of rural household involvement in these new models of agro-industry. My research seeks to investigate them and to throw light on underlying household motivations for participation, as well as on entry constraints and effects on rural livelihoods. Eventually, I hope to provide a systematic and dynamic picture of Chinese rural household involvement in today’s agro-industry models.

## The Sweet Potato Sector in Sichuan Province

Attention in China’s literature and news coverage has mainly focused on more developed agro-industry (such as vegetable, fruit and dairy processing in Shandong province). The case study I have chosen is the sweet potato (SP) processing economy in Sichuan province. SP production has a long tradition in China. With 86 per cent of world output China is the leading producer of SP,<sup>18</sup>

12 Sun Yu, “Nongye chanyehua longtou qiye he nongmin hezuo zuzhi chengwei nongmin zengshou de xin de daidong liliang” (“Agricultural industrialization DHEs and farmer co-operative organizations become the new impetus for increasing farmers’ incomes”), *Agricultural Industrialization News Network* (2004). One local government official further says: “to support agricultural industrialization means to support agriculture, DHEs and farmer specialised cooperative organizations” (Li Ronggen, “Raise farmers’ income”); see also Sun Yu in *ibid.*

13 Shen Minggao, Scott Rozelle and Zhang Linxiu, “Farmer’s professional associations in rural China: state dominated or new state–society partnerships?” (2004), p. 3; Jorgen Delman, “Farmer organisations in China: hope for survival? Empowerment dimensions in the development of China’s rural civil society?” paper presented at the Chinese University of Hong Kong Universities Service Centre, 30 November 2004, pp. 5–6.

14 The fact that various names have been used to describe such organizations (e.g. “rural specialized technical associations,” “specialized research associations,” “rural specialized associations under shareholding arrangement” and “farmer specialized co-operative organizations”) adds to the apparent confusion (see Delman, “Farmer organisations in China,” p. 8; Sun Yu, “New impetus”).

15 Delman, “Farmer organisations in China,” p. 5.

16 Shen *et al.*, “Farmer’s professional associations,” pp. 17–18. This source also provides information on farmer associations’ regional distribution (including comparisons between rich and poor areas, and those close to and remote from economic centres) and factors affecting their emergence.

17 Bruce Ross, “Opening statement,” in OECD (ed.), *The Agro–Food Processing Sector in China* (Paris: OECD, 2000), pp. 17–20.

18 Figure for 1999: Huang Jikun *et al.*, *Sweet Potato in China: Economic Aspects and Utilization in Pig Production* (Bogor: International Potato Centre, 2003), p. 10.

and the western and relatively undeveloped province of Sichuan<sup>19</sup> is the largest SP production region with 21 per cent of total national production.<sup>20</sup> Traditionally, SP served as a food security and staple crop, grown by small farmers in poor mountain areas. Since the 1980s, technology improvements, changing dietary habits and rural-to-urban migration have led to a decline in direct consumption of fresh SP. This was offset by an increase in its use for livestock production and for processing. It is estimated that in the 1990s direct food consumption was 11 per cent, and feed and processing use 60 and 19 per cent, respectively.<sup>21</sup> The most important product of primary SP processing is starch, which is further processed into noodles, including instant noodles.<sup>22</sup> Other primary processed products are SP chips and peeled SP, both of which are further processed into snack food.

The expansion of processing was driven by a relaxation of government control, which allowed the traditional small-scale rural household processing sector to increase, as well as by the agro-industrial developments described above. Consequently, four national, six provincial and 15 county-level SP processing DHEs have emerged.<sup>23</sup> These processors, with their production of more sophisticated products, provide important new outlets for relatively poor SP farmers. Furthermore, local associations are being promoted for SP industrialization in Sichuan.<sup>24</sup> The SP sector offers therefore an excellent case study for examining the changing involvement of rural households in agro-industry and for investigating its developmental effect on poorer parts of China.

## Research Methodology

The report is based on the findings of a small-scale survey undertaken in Sichuan province in 2004 and 2005.<sup>25</sup> Following extensive literature research on China's agricultural industrialization, rural livelihoods and the SP sector, two

19 Including Chongqing municipality.

20 Annual average for 1997–1999: Huang Jikun *et al.*, *Sweet Potato in China*, p. 23.

21 *Ibid.* p. 26.

22 Instant noodles are the main product of the two national DHEs covered by the study. Although no exact data are available, less than 5% of SP production in Sichuan is processed into instant noodles.

23 These different-level DHEs are separate entities and operate independently from each other.

24 For more details on SP production and processing development, see Keith Fuglie *et al.*, "Development of a sweet potato processing industry and its impact in Sichuan, China" (International Potato Centre (CIP), 2004); Huang *et al.*, *Sweet potato in China*; Dai Peters, "Sweet potato processing for poverty alleviation and rural stability in China: a case study of Yilong county in Sichuan" (CIP, 1999); Wang Yi, "Overview of sweet potato production in China," CIP China Liaison Office in Beijing; Christopher Wheatley *et al.*, "Enhancing the role of small-scale sweet potato starch enterprises in Sichuan, China," Program Report 95–96, Program 6 Postharvest Management (CIP, 1996); Christopher Wheatley and Song Bofu, "Sweet potato starch in China: current status and future prospects" (CIP); Xie Jiang *et al.*, "Development of sweet potato post harvest processing and utilisation in Sichuan province, China," Crop Research Institute, Sichuan Academy of Agricultural Sciences (SAAS) (Chengdu: SAAS, 2004); Zhang Xiaohui, *Agricultural Marketing in a Country in Transition. Case of Sweet Potato Products in Sichuan, P.R. China*, Mansholt Studies, No. 13 (Wageningen: Wageningen Agricultural University, 1999).

25 The entire fieldwork phase was kindly sponsored by the International Potato Centre (CIP), the University of London Central Research Fund and the School of Oriental and African Studies. I would like to express my special gratitude to Dr Keith O. Fuglie (Leader CIP Impact Enhancement Division Bogor, Indonesia), Dr Wang Yi (director CIP–China Liaison Office), Huang Gang (vice-president SAAS), Hu Jianjun (post-harvest researcher SAAS) and Xie Jiang (leader post-harvest unit SAAS),

exploratory trips to Sichuan were conducted in September and November 2004. During these trips, all four national and one provincial SP DHE as well as two RAs were visited and semi-structured interviews conducted with all relevant stakeholders, including DHE management, RA leaders, rural households and workers. Throughout, DHE/RA linkages with rural households were reviewed. In addition, semi-structured background interviews were conducted with researchers from the International Potato Centre, the Sichuan Academy of Agricultural Sciences and regional agricultural academies, as well as with relevant government officials.<sup>26</sup>

Based on the initial findings the sites for further in-depth study were selected: two national DHEs with a large national market share in instant SP noodles, and two SP processing associations, all based on their typical rural household linkages in the SP sector. For each of the four entities a more detailed research programme was agreed, including follow-up interviews with DHE/RA decision makers, local government officials, and rural households linked to the DHEs/RAs through SP production, primary processing or employment. For the household survey, a questionnaire was developed and pre-tested.

The interviews were conducted in March and April 2005, focusing on existing linkages from both a DHE/RA and rural household perspective. Access to the households was provided through introductions by the Sichuan Academy of Agricultural Sciences, DHE/RA leaders or other interviewees. As most production areas tend to be low-income areas, the SP production and processing households were chosen for their linkage with the four entities, not for particular household or regional characteristics. A comparative group of SP producing and/or processing households without DHE/RA linkages were selected in addition, including household neighbours to those involved with a DHE or RA, as well as households living in a SP production area without any DHE/RA connections. Altogether 35 questionnaire-based household interviews (comprising fixed-choice and open-ended questions) were conducted. While each household interview took between 40 and 90 minutes, interviews with DHE/RA representatives, researchers and government officials took up to several hours. Interviews took place in Sichuan's capital Chengdu (成都) and numerous villages in Chadian (茶店), Guangxing (广兴), Luodai (洛带), Zhouli (周礼) and Lianshan (连山) townships, in Jianyang (简阳) and Jiangyou (江由) municipalities, and Youxian district (游仙区) of Mianyang city (绵阳市).

Other data sources included enterprise documents (such as contracts and quality-price arrangements), association materials (constitution and membership lists), government information letters, local newspaper articles and television programmes.

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*footnote continued*

without whom this fieldwork would not have been possible. The author's PhD was further generously supported by a Universities' China Committee in London Bursary in Chinese Studies.

26 Details about interview content and partners can be obtained from the author upon request.



## Rural Household Involvement in the SP Agro-Industry: Preliminary Findings

### *Rural households and dragon head enterprises*

All DHEs in Sichuan's SP processing sector undertake final processing and packaging of their products for distribution to wholesalers and retailers (see Figure 1). In order to source raw materials and intermediate products, they have developed a complex system of production chain linkages with rural households. Farm households produce fresh SP, which, because of their perishability, undergo primary processing in the rural areas. The intermediate product is crude starch, which is easier to store and transport. National DHEs then process the starch into SP noodles. If the DHE – as seen in the case of a provincial-level DHE – is situated in the rural SP production area, it appears that primary processing takes place within the enterprise. Where products other than noodles are produced, a different process may be required: in the case of SP cracker production, for instance, primary processing in the rural areas is limited to SP peeling.

The two national DHEs chosen for detailed study have established a wide range of linkages to rural households. Both engage in instant SP noodle production, a product for which they have a national market share of approximately 50 and 30 per cent, respectively.<sup>27</sup> Together they link with around 65,000 rural households.<sup>28</sup> Three major linkage forms emerge. One is an employment link, either directly in the DHE or through rural primary processing. The others are contractual links: one, through the establishment of a production/processing base in a rural area, where raw material and intermediate products are produced; the other – less common – through the lease of land from farm households for SP production.<sup>29</sup>

The employment linkage takes two major forms. One is direct employment within the DHE, where most rural workers are employed in factory production and a smaller number in sales and transport.<sup>30</sup> Workers sign one-year contracts, which state salary and contract duration details. There is no minimum salary, since pay is entirely performance-based (by production piece rate). Generally, men and women receive an equal rate of pay.<sup>31</sup> In addition to their salary,

27 The SP instant noodle market being a niche market as described earlier, this degree of market concentration need not be perceived as unusual.

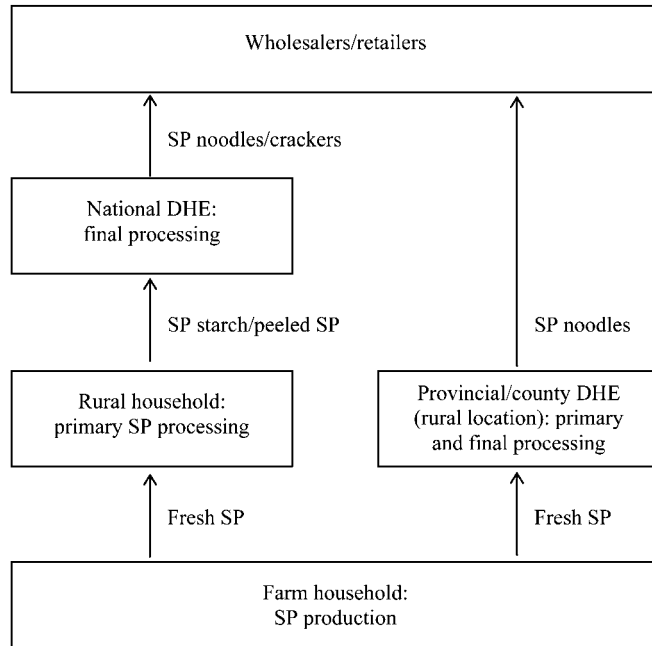
28 According to company data, one of the DHEs involves around 200,000 rural households. But from output estimates these figures seem exaggerated, and a more realistic estimate suggests a maximum involvement of 25,000 households in any year (personal communication from Dr K. Fuglie, CIP).

29 The forms of DHE linkages with rural households that are revealed by my fieldwork differ significantly from those documented in earlier studies (e.g. see ADB, "PRC agro-industry").

30 Since my main focus is on linkages with rural households, I only interviewed those with a rural registration. Employees with a university degree were usually excluded, because attendance at a university seems to confer urban registration on rural residents. Thus, the majority of respondents in this category are production workers with relatively low levels of education. An exception was a manager who had retained his rural registration.

31 But men tend to earn more. They either have more physically demanding jobs or are in more leading positions than women.

Figure 1: DHE Involvement in SP Processing in Sichuan



Source:  
Author's fieldwork.

workers are provided accident insurance, uniforms and on-site housing. To improve performance further, free regular training is offered to workers. The second form of employment linkage between DHEs and rural households is indirect. Here, primary processing enterprises in rural areas employ small numbers of workers on a seasonal basis in order to produce the intermediate product for the DHE. Typically, there is no job contract, work is less well paid than in the DHEs, and workers receive no additional employment benefits, except for an occasional meal.

Establishing a production/processing base is another method widely used by DHEs to forge stable links with rural households. The base comprises a number of households located in one area, though sometimes spread over several villages. They engage in SP production and primary processing on behalf of the DHE. Usually SP producing and processing households are separate entities, though processors sometimes grow some of their raw material themselves.

Establishment of a base requires the DHE to sign an agreement with the township government. This specifies the size of the base, its coverage in terms of villages and rural households, and the terms of co-operation between company, township government and households. The local government's responsibilities



are: to guarantee production and processing in compliance with company quality requirements and techniques; to choose model production and processing households; and to organize processing households and ensure that they sell all their crude starch to the company. The company in return undertakes to introduce improved varieties to the base at a price specified in the agreement, to advise on cultivation techniques, and to provide processing equipment and technological training for processors. Most importantly, the agreement specifies a minimum price – a so-called “protection price” (*baohu jia* 保护价) – for crude starch. If this is lower than the market price, the processors receive the market price.<sup>32</sup>

When the co-operation agreement has been signed, the village leader usually organizes the households on behalf of the township government. Within the base, production households receive the company’s seed variety.<sup>33</sup> After harvest, the producers sell their fresh SP to the designated processors. The company does not require producers and processors to have any production-purchase contract, and generally no such contract exists. According to company information they do, however, agree on a protection price for fresh SP purchase.<sup>34</sup> Processing equipment requires an investment of 20,000–30,000 yuan. Depending on the area’s level of economic development, either the DHE provides all the equipment or processors and/or township governments are required to make a contribution. After primary processing but before starch sale, processing households receive a company circular stating purchase prices according to three different quality grades. It is observed that once the DHE–rural household linkage reaches a more mature phase – that is, when participating household numbers exceed approximately 500 – the DHE establishes an intermediary forum for communication, problem solving and innovation.<sup>35</sup> This is funded entirely by the DHE, which also provides its leader. Other members are drawn from the township government and rural base households.

The second national DHE uses a similar production/processing base model to forge links with rural households, although its links are mainly with the primary processors only. It provides equipment, training, ongoing technical advice for processing and production, and improved seed varieties for distribution among

32 The market price is determined by the company and the township government by investigating and calculating the average price in the areas surrounding the base.

33 Depending on the agreement with the township government and the area’s general level of development, these seeds are provided either for free or sold to rural households for 1 yuan/kg.

34 In the absence of contracts between producers and processors, there is no evidence of this protection price being paid to producers. Nor did my interviews enable me to confirm the use of protection prices. This does not rule out the possibility that it is used in some cases to guarantee a steady inflow of raw material for the processor.

35 This forum is called an association, but in terms of function and set-up, it resembles a meeting “platform,” or forum, provided by the DHE. In the past, cultivation requirements or purchase details (e.g. price) have caused conflicts between the company and farmers. In such cases, the forum brings the different parties together to resolve differences. It also addresses cultivation problems, initiates improvements (e.g. in variety use) and provides rural households with technological knowledge. The information flow, however, is not one-way. E.g. in making the seed choice, rural households are invited to use the forum to express their opinion to the company.

producers. Following primary processing, it purchases the starch. In most cases, the DHE and primary processor enter into a one-year starch purchase contract, which specifies the expected starch purchase volume, purchase procedures, price finding and conflict resolution methods. The purchase price is not specified, but is determined separately through a quality-price grading schedule provided to the processors shortly before SP harvest. Apart from these input-output linkages with the DHE, primary processors seem to run their business with considerable autonomy. Processors, for instance, make their own decisions on SP quantities purchased, choice of producers, purchase and (optional) protection price, as well as on ways to link with producers. In some cases they even preferred *not* to sign a contract for starch purchase but to deal with the DHE on an ad hoc basis. The processors are very confident that the DHE will purchase their starch output, although there is evidence that they also fear having to make compensation payments should they fail to comply with contract stipulations.

The case of one of the DHEs illustrates the third linkage form, land lease linkage, whereby the DHE enters into a direct contract with the farmer to lease his or her land use rights for SP production. Contrary to the base linkage described above, no processing households are involved in this linkage pattern. SP production is not intended for the processing cycle, but is used exclusively for SP seed production and subsequent distribution to the DHE's production-processing bases.

Land leases are organized in two ways. One is determined by a "land lease, worker recruitment and management contract." It specifies the land area which the village committee<sup>36</sup> agrees may be transferred for the duration of one year, as well as the company's intended land use, management requirements for existing agricultural crops on the land (such as fruit trees), rental and other fees, payment and compensation agreements. It effectively transforms the farmer who leases the land into an agricultural labourer: the contract specifies company-determined details of the farmer's SP seed production and delivery to a chosen location. Thus, the fee paid to the farmer consists of two main components: a land lease fee and a wage payment for SP production and other cultivation work.

The second approach resorts to a pure land lease contract between the DHE, the farm household and the village committee. Much as in the previous example, this contract specifies the transfer of land use rights to the company. But it leaves open who actually engages in SP seed production on the leased land and how SP output will be purchased and paid for by the DHE. Instead of being complemented by another labour rent and/or purchase agreement, the contract simply states that the village committee is responsible for mobilizing village (*cun* 村) and village group (*she* 社) cadres as well as farm households. Interviews with rural households, especially non-participating neighbours, brought clarification:

36 I.e. as the collective owner of the land.

the DHE pays the village or production group leader, who in turn organizes and pays the farmers for seed production work. According to company information, the fee paid for land lease in both approaches does not distinguish between land quality. Within a single area all returns to land are equally high; between different areas, however, prices range from 6,000 to 13,500 yuan per hectare.

### *Rural households and rural associations*

As RAs are another prominent model for agricultural industrialization, I visited two so-called “SP industry associations” (*hongshu chanye xiehui* 红薯产业协会) in Sichuan to investigate rural household involvement. One is situated in a county where, with local government support, the SP industry had gained in importance during the past ten years. In 2004, the government sought to integrate SP production, processing and marketing. The former SP Noodle Association was therefore turned into a SP Industrialization Association. Current membership of this RA is 233 individual rural households, who engage in SP production, starch processing, noodle processing or marketing.<sup>37</sup> Four corporate bodies – large-scale enterprises engaged in breeding SP seed varieties, SP processing and chemical fertilizer production – are also members.

The RA has a constitution, which governs its business scope, member rights and duties, organizational structure, use of assets, association amendment and closure procedures. Members are involved through their right to vote and be elected for representative positions within the association, their right to receive its services and supervise its work, and the right and duty to participate in association activities. Membership is voluntary and withdrawal is unrestricted. The RA leaders are former government officials. In order to promote the local SP economy, they organize pre- to post-production services which are offered to association members.<sup>38</sup> Currently, these services are provided free of charge since the RA is largely funded by local government.<sup>39</sup> Nor, during the first year of its operation, was a membership fee required.<sup>40</sup> The association operates on a not-for-profit basis. Members sell their entire production individually to traders, processing or marketing households at market prices, and the association is involved in neither product marketing nor price setting.

The second RA I visited was established by the local township government in late 2003. The impetus for its creation came from two entrepreneurial families. The relationship between the RA and local government/Party remains close: the government provides funds and gratis services to support the RA. Nevertheless,

37 The noodles processed by them must be distinguished from those produced by large-scale DHEs (above): the former are manually-produced noodles aimed at the local market and hotpot restaurants, whereas the latter are instant noodles produced on a large industrialized scale mainly for the urban market.

38 Materials (e.g. processing equipment) are not supplied. Instead, the association establishes links between members and manufacturers.

39 If future government funding should be reduced, a service fee cannot be ruled out (source: association leader).

40 From 2005 onwards there will be an annual household membership fee of 5 yuan.

government and RA leaders emphasize that it is a privately operated, non-governmental organization with private responsibility for profits and losses. To date the RA has 268 members, consisting of four large-scale end-processors from the entrepreneurial families, three large-scale SP producers and a majority of small-scale primary processors.<sup>41</sup> As in the previous example, the RA has a constitution which determines its business scope, membership criteria and application, member rights and duties, internal organization and use of assets. Members pay a yearly membership fee, and are free to join and withdraw membership at any point without additional costs. Leadership is wholly provided by the four end-processors and a local cadre *not* engaged in the SP economy.

The RA provides no services to its members, its apparent purpose being mainly to assemble smaller-scale primary processors for the leading final processors. The latter confirm a protection price at which they guarantee to buy all semi-finished products (dried SP chips) from member processors. They then produce the final product (fried SP chips), which they sell at a uniformly determined price to wholesalers.<sup>42</sup> All purchases along the chain are based on spoken agreements.

On the surface, both cases seem to fulfil the requirements for a “true” RA. They are formal organizations insofar as they are legally registered with the Township Civil Affairs Bureau, and they declare verbally and constitutionally to serve the collective interests of their members in accordance with principles of voluntary participation, self-organization and democratic decision-making. However, on the basis of a useful definition of a truly “functional” RA given by Shen *et al.*, which excludes associations whose main function is to act as a commercial enterprise and whose decisions are made by a township or village official,<sup>43</sup> the two cases do not meet the criteria of truly functioning RAs. One of the organizations is initiated and funded by government, led by former government officials, and directed by the government’s development policy for the SP sector; it is unclear to what extent rural members are involved in, for instance, decision-making. The other organization consists of private entrepreneurs who have assembled primary processors and SP producers in an organization to guarantee product supply. Although formally the leaders can be elected by members, they are in fact chosen on the basis of their production and marketing power.<sup>44</sup> It is likely that the organization refers to itself as an RA in order to secure local government support and preferential tax treatment. Yet

41 The end-processors are referred to as “large-scale” even though their processing operations are household-based and small, compared with DHEs’ large industrial scale processing. Within the association, however, their output is relatively large – about three times bigger than that of small-scale household-based primary processors.

42 The end-product price seems not to be determined by the semi-finished product price but vice versa. The end-product price is influenced by related market prices, i.e. the price of close substitutes.

43 Shen *et al.*, “Farmer’s professional associations,” pp. 8–9. This definition is helpful in distinguishing “true” RAs from enterprise and government organizations.

44 Interview with the association leader, 22 April 2005.

these so-called RAs are presented as role models for SP industrialization in Sichuan.<sup>45</sup> Personal observations and interviews with provincial government officials and researchers also suggest that these RAs – especially the second example – represent the “typical” RA in Sichuan’s SP sector.

Seen in this light, one may conclude that RAs, rather than serving the interests of rural households, serve those of a small number of powerful local entrepreneurs. It appears, however, that these RAs also reflect the very specific conditions of the SP market, namely, that compared with farm products such as mushrooms and fruit, there is only a very limited number of buyers for fresh SP (most of which is used on-farm for fresh consumption, pig feed and seed production). While other sector-specific associations have links with a number of market players, in the SP sector RAs often seem restricted to a single enterprise that provides market access. An evaluation of the RA’s impact on rural livelihoods should therefore not simply focus on its ability to fulfil the criteria of a “truly functional” RA, but should also take into account such sector-specific conditions. After all, from the perspective of poor rural households, such RAs, though not functioning in the sense of being farmer-initiated and farmer-operated associations, may still prove a valuable model for agricultural industrialization under given production and market conditions. In the case of the RAs studied, this means that despite severe inadequacies, such as in decision-making, they nevertheless serve as a provider of services, market access and income for rural households. This deserves further analysis.

### **Implications from Involvement in DHEs and RAs**

The previous analysis demonstrates that rural households have become involved with DHEs and RAs in various ways. Such involvement has affected the roles of rural households within the agro-industry chain. Traditionally, the role of rural households had been reduced to SP production and sometimes processing of starch and noodles for their own consumption or sale on local markets. Today, the role has significantly broadened. Many farmers have become raw material suppliers, producing to pre-production order and according to specific enterprise requirements; they have become primary processors for DHEs or RA enterprises; they have become providers of land and have been transformed into agricultural workers; and they have also become industrial workers in both DHEs and in rural primary processing enterprises.<sup>46</sup> What follows is a preliminary analysis of some of the benefits of rural household participation in these agro-industrial models, as well as some of the potential constraints associated with such involvement.

45 E.g. the second RA has received many local government honours.

46 Rural households are not necessarily restricted to a single role. I have encountered many cases of diversified income generation, e.g. where a farmer is a raw material provider and a worker in a primary processing enterprise. Nor is there a clear divide between rural households’ roles in DHEs and RAs (e.g. both forms involve raw material suppliers and primary processors).

All respondents reported increases in income since their involvement with DHEs or RAs. For most of them, expectation of a rise in income is the primary motivation for such involvement. From hardly any commercial income from SP, rural households now reported reaching gross incomes or revenues as shown in Table 1. Overall, although respondents feel their involvement with DHEs or RAs does not necessarily entail less effort and hardship, most say that for the first time in their lives “the returns are worth it.”

Involvement with DHEs, as well as in one of the RAs, also generates an additional benefit: the provision of capital and/or services for SP producers and processors. Two of the effects of post-1978 agricultural production and marketing reforms were to suspend many collective services and to reduce state investment in agricultural capital construction.<sup>47</sup> To a varying degree, DHEs and RAs have helped close these gaps through their investment in rural bases and the institution of services, such as seed, training, equipment and information provision.

Moreover, DHEs and RAs guide rural households in production/processing activities, and help increase output quality and quantity. They provide a sales channel for output, which would otherwise be very difficult to find. By often guaranteeing a minimum purchase price, they also significantly reduce price risks associated with direct market entry.<sup>48</sup> Through the use of production and processing contracts for usually at least one year, the linkage with DHEs gives rural households a degree of stability which would be absent in ad hoc market transactions. The existence of these contracts can be seen as a significant development from previous practice.<sup>49</sup> Stability is similarly enhanced for industrial workers and even for those involved in primary processing enterprises on only a seasonal basis. Such work also means a successful diversification of income risks associated with their usual farm activities.

By establishing rural production bases that include primary processors, DHEs effectively foster entrepreneurship among rural households. Processors receive assistance for creating and operating a processing enterprise, but ultimately they are the autonomous manager of the enterprise, with sole responsibility for operation scale, linkages with producers and employment. By supporting this enterprise creation, the DHEs make a further contribution to income and employment generation in rural areas. The primary processors that I visited each employed up to 15 workers on a seasonal basis. This may seem small, but bearing in mind that there are some 3,000 DHE primary processors – let alone taking into account the DHEs’ and RAs’ direct employment and income impact

47 See Robert Ash, “The peasant and the state,” *The China Quarterly*, No. 127 (1991), pp. 493–526.

48 The extent to which these claimed protection prices are honoured may vary.

49 This case study does not imply the general use of such contracts in other industries/regions. In addition, the scope of enforcement of such contracts may vary. I can, however, confirm from personal observation that – perhaps contrary to expectations – such contracts do exist. The supply–demand balance for SP may provide incentives for the DHEs to enter such contracts and thereby secure reliable long-term supplies.

Table 1: **Approximate Annual Gross Income/Revenue from Involvement with a DHE/RA**

| <b>Nature of work</b>                        | <b>Annual gross income/revenue</b>                                     |
|--|--|
| Land lease and agricultural worker           | 12,000–19,500 yuan/ha  |
| Raw material provider for primary processors | 6,750–13,500 yuan/ha <sup>a</sup>                                      |
| Primary processor for DHEs                   | 2,400–3,000 yuan/t dry starch <sup>b</sup>                             |
| Primary processor in RA <sup>c</sup>         | 2,800–3,000 yuan/t dried SP chips <sup>d</sup>                         |
| Final processor in RA <sup>c</sup>           | 4,600–5,400 yuan/t fried SP chips <sup>e</sup>                         |
| Simple production worker (female) in DHE     | 8,400–9,600 yuan <sup>f</sup> (five to six-day week)                   |
| Worker in primary processing enterprises     | 4,320–7,200 yuan <sup>f</sup> (seven-day week, seasonal <sup>g</sup> ) |

*Notes:*<sup>a</sup>based on an observed yield of 22.5–45 t/ha and a price of 300 yuan/t<sup>b</sup>volume per processor ranged from 10 to 40t<sup>c</sup>data based on only one RA<sup>d</sup>volume per processor ranged from 10 to 24t<sup>e</sup>volume reached approximately 160t<sup>f</sup>net salary<sup>g</sup>My fieldwork reveals employment duration in primary processing enterprises varying from two to four months per year. Other surveys show that small-scale rural starch processing (e.g. in Shandong province) took place for only 20–60 days per year (personal communication from Dr Fuglie, CIP). Similarly, SP production is seasonal (see Zhang Xiaohui, *Agricultural Marketing in a Country in Transition. Case of Sweet Potato Products in Sichuan, P.R. China*, Mansholt Studies, No. 13 (Wageningen: Wageningen Agricultural University, 1999), p. 50).*Source:*

Author's fieldwork.

on SP producers and primary processors – it offers a significant, albeit seasonal, alternative to rural–urban migration.

On the other hand, within the rural community, involvement with DHEs and RAs remains restricted to regions characterized by the existence of a supportive local government, favourable infrastructure conditions, high quality land and high skill levels. Moreover, within these regions, not all households have equal access.<sup>50</sup> DHEs formulate specific participation criteria,<sup>51</sup> and/or local government officials choose participants on the basis of skill levels, production techniques and local relationships.<sup>52</sup> As to RAs, the village government's prior recommendation is needed before the RA board will consider a household's membership. Typically, members are large-scale specialized households,<sup>53</sup> with long production experience, high-level processing technical skills and extensive

50 While the DHEs maintain that all those who want to participate can usually freely do so and that participation rates reach 70–100%, I have seen areas with much lower participation. In one village group (*zu*) participation was around 10%. This seemed attributable to DHE choices, not to rural households' reluctance to participate.

51 As one DHE manager stated, they have a so-called "preference circle," which includes households with sufficient manpower, experience and technical skills, appropriate land quality and an ability to make financial contributions to the purchase of processing equipment.

52 E.g. during fieldwork I witnessed a case in which the primary processor delegated choosing SP producers to the local government. On another occasion, I was told by a primary processor that his involvement with the DHE was not on his own initiative but was "suggested" to him by the township government (though judging from the benefits from his involvement, I doubt that he participated involuntarily).

53 In one of the RAs investigated, over 90% of members were large SP producing, starch and noodle processing and marketing households.



marketing knowledge. By contrast, surprisingly few employment requirements were specified for workers in DHEs and primary processing enterprises. For these, the “entry ticket” seems to be personal relationships: they are recommended by friends who already work in a DHE, or they are recruited among family, friends or neighbours for work in primary processing enterprises. Workers in DHEs also tend to be young and female, while primary starch processing, being more physically demanding, requires more males.

In addition to potential entry barriers, there are other drawbacks to rural household involvement in agro-industry. In none of the cases I encountered had households received any legal advice before signing binding contracts of co-operation, despite inclusion of extensive provision for compensation in the event of non-compliance.<sup>54</sup> One must bear in mind that many farmers who sign contracts have only received primary education. Normal procedure seems to be for a single individual in the village, who understands the contract, to sign it. The rest simply trust his judgement. In such circumstances, it is not surprising that the contract was not always fully understood, leaving problems to emerge only later.

Moreover, rural households face largely monopsonistic price-setting by DHEs and RA leaders. In any given area there is usually only a single DHE or RA available for co-operation in processing, and any other local markets for selling SP are severely limited or non-existent. Consequently, rural households become very dependent on these agro-industry outlets, as a result of which their bargaining power for higher prices is further reduced. Additionally, risk sharing does not necessarily work in favour of those at the bottom of the chain. In one RA case in particular, all downward movements in end product prices seemed to be fully passed on to the primary processors. To the extent that the latter are unable to pass this downward movement on to the SP producers, the primary processors become the bearer of the entire downside risk.<sup>55</sup> Finally, none of the cases I studied had recourse to any profit-sharing mechanism.

## Representativeness of the Study and Further Research

A complex system of linkages between the two agro-industry models and rural households has developed in Sichuan’s SP sector. During fieldwork, I enquired about other agricultural products and their patterns of farmer (–processor) – market chain in order to place the SP agro-industry into the broader context of China’s agricultural industrialization. Preliminary results indicate that the patterns of DHE–rural household linkages described in this report are

54 I encountered only one case in which a primary processor used notary certification. This was done in order to gain the trust of local farmers who in recent years had heard of many scams that had left farmers cheated.

55 Determinants of this risk for the primary processor are SP purchase volume, purchase frequency and time lag between purchase and on-sale, subject to any government intervention on behalf of the SP producers.

representative of other DHEs throughout the country.<sup>56</sup> Similarly, the two RAs seem to represent forms typical of RAs in China today.<sup>57</sup> At this point it is difficult, however, to confirm their representativeness.

A preliminary analysis of the impact on rural living standards of DHE and RA links with rural households shows a mixed picture. Increases in participants' incomes, employment and entrepreneurship were the most likely positive effects. But there are also negative consequences: entry barriers to participation are numerous and polarize the rural population between those with and those without access to potentially very beneficial involvement. The distribution of benefits seems to be uneven across the value chain, often favouring the already better-off. The absence of neutral legal advice before signing a contract and monopsonistic price-setting practices also threaten to undermine households' potential gains. My future research will look at both the strengths and weaknesses of DHEs and RAs in an attempt to reach a more conclusive assessment of their value for agricultural industrialization and their ability to improve rural livelihoods. Meanwhile, the evidence presented here leads me to believe that the further development of agro-industry will be a key determinant of China's future rural social and economic trajectory.

56 There are many such examples. E.g. see the case of Longda Foodstuff Group Co., which has created links with over 400,000 farmers and workers through contracted farming, land lease and factory employment (Andrew Browne and Lai Yang, "Peasants bloom," *Far Eastern Economic Review*, 14 October 2004, pp. 32–36).

57 Personal communication with SAAS researchers. See also Shen *et al.*, "Farmer's professional associations"; Jorgen Delman, "Cool thinking? The role of the state in shaping China's dairy sector and its knowledge system," *China Information*, Vol. 17, No. 2 (2003), pp. 1–35; and the report of a vice-minister of agriculture who stated that as well as farmers linking with enterprises, a widespread method of current agricultural industrialization involved farmers linking with enterprises and co-operative organizations ("China needs to beef up agricultural industrialization," *China Daily*, 18 December 2002).