

Study on the Development Path of Apple Industry in Wanrong County from the Perspective of the Integration of Three industries

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Abstract: In 2015 the central government proposed the coordinated development of three industries in rural areas. Only by improving the mechanism of integrated development in rural areas and, can farmers can share more added value brought by the industries. Based on the current condition of the apple industries in Wanrong county, the essay analyzes advantages and disadvantages of the apple industry in Wanrong in the process of the integrated development of three industries and threats as well as opportunities it has by combining four models of integrated development of apple industry and adopting SWOT method. It also proposes three development paths of the apple industry in Wanrong county form the perspective of the integration of the three industries.

1. Introduction

In 2015 the central government proposed the coordinated development of three industries in rural areas. At the end of 2015, the General Office of the State Council released the *Guiding Principles to Promote the Integrated Development in Rural areas*, in which the government makes it clear to follow the original development path of the integration of three industries in rural areas. Only by improving the mechanism of integrated development in rural areas and, can farmers can share more added value brought by the industries, and by doing so, the integration of three industries can help to achieve economic growth in rural areas, industrial prosperity and rural rejuvenation.

The integration of three industries refers to the intensive allocation of capital, technologies, and resources by linking and integrating the industries, applying technologies, as well as innovating the system based on the agricultural industry and comprehensive development of the secondary industry such as processing industries of agricultural products. It also refers to the integration of third industries ranging from agricultural production, marketing, catering, leisure agriculture, and other industries. Wanrong county of Yuncheng, Shanxi, located in the most suitable areas for fruit production, plays a significant role in apple production of the province. The apple industry, which has become the core industry of the county, has a significant effect on the economic growth of the county. The development model of the integration of three industries can achieve the integration and coordinated development of traditional apple industries and other industries, and as a result, the industrial chains can be expanded, agricultural industries can be diversified, and farmers can share the added value. Thus it is of profound significance to study the development path of the apple industry in Wanrong county of Shanxi Province from the perspective of integration of three industries.

2. Analysis for the Model of Integration of Three Industries

2.1. Integration of the Whole industries

The development model of “the Integration of the Three industries” was proposed by China Oil & Foodstuffs Corporation (COFCO) in 2009. According to the company, the implementation of “the Integration of the Three industries” for a core enterprise should be guided by the consumer’s need, and it contains different aspects ranging from planting, trading, logistics, processing, and marketing. Its increase model of value refers to strengthen the ability of every industry chain and every aspect by maximizing the value of industry chain and value redistribution, and in these ways, a new network of

the industrial chain can be formed. An expanded and integrated industry chain leads to an integration of different industries; thus, industry value can be increased, and the coordinated development of three industries can be achieved.

In September 2015, the guiding principle of “focusing on deepening supply-side structural reform in agriculture” was proposed in the annual central conference on rural work dictating an extension of the functions of traditional agriculture and deep integration of agriculture, tourism, education, culture, and health care services. By making an overall plan to utilize present resources to build social practice bases of farming culture, roll out leisure agriculture and rural tourism projects with competitive edges, and conduct practice for agricultural affairs, cultural and creative agriculture, ecological health care services in rural areas, as well as sightseeing and picking, agriculture can enjoy multiple development and integration of second and third industries.

2.2. Integration of Agricultural Industry Cluster

The agriculture industry cluster refers to the production base of agricultural products, its relative institutions, and the processing of agricultural products, mainly reflecting by the building of agricultural industrial parks. The 2017 No. 1 Document proposed that with the base of large-scale planting center and the guidance of the leading enterprise of industrial, agricultural production, we should gather modernized means of production and to build modern agricultural production park featuring by ‘production, processing as well as science and technology. By gathering the companies that have the same characteristics and complement each other, an industrial cluster can be formed, and the collaboration of different industries can be seen. By doing this, we can transfer the traditional agriculture into one with high added value, which can increase the interest and make the modern agricultural industries more matched with the pace of social-economic development.

2.3. Integration of Science and technology

The innovation of science and technology is an essential driving force for the integrated development of three industries, reflected by the innovation, development, and integration of modern science and technology, and change and innovation promoting the industry such as agricultural technology, processing technology, cold-chain logistics, and information technology. Furthermore, it is the information technology, ranging from the internet of things, big data, and internet plus that makes improvements to the traditional agriculture, but doing so, the new forms of agricultural industry such as internet plus agriculture mode and e-commerce for agricultural products emerge.

3. The Current Conditions of Apple Industry Analyzed from the Prospect of the Model of the Three Industries

3.1. A Complete Industry Chain

3.1.1. The Chain of Planting

Wanrong County is a large fruit producer of Yunchen city, and it is one of the 10 largest ten apple producers at county level in China. It boasts a fruiter covering an area of 34,000 hectares and 80,000 orchard owners. With an annual apple production of 1.05 million tons. In recent years, the county cooperates with universities and promotes as well as applicants new species and new technologies. As a result, 2 R&D platforms at the provincial level and a demonstrated base for new species covering an area of 200 hectares were built.

3.1.2. The Chain of Processing and Transporting

Some enterprises such as Huiyuan, Zhonglu, and Fangyuan have set their factories in the county to conduct the deep processing of fruits, and they are improving their product lines and increasing product series. The county offers subsidies to the leading fruit companies represented by Wangxian, Huarong, and Hongxiang. By doing serious Sorting, packaging, warehousing, shipping, the ability of cold-chain logistics management have been improved. Blessed by the 209 high way and Yunchen-Sushan expressway, and the large-scale construction of advanced temperature storage, air

conditioning storage, the apple industry now has storage in every 3 kilometers and a market in every 5 kilometers.

3.2. The Chain of Exports

The county's online and offline apple sales systems have taken shape, with more than 80 e-commerce logistics enterprises and more than 1,000 fruit brokers. In terms of the agricultural development of earning foreign exchange through export, Wanrong county has made great efforts to improve the construction of the "three major systems" of safe production, quarantine inspection, and fruit sales in the agriculture of earning foreign exchange through export. The licensed bases of export in the county now cover an area of 3800 hectares, and there are 15 agricultural product export enterprises.

3.3. Remarkable Results Have Been Gained in the Coordinated Development of Agriculture and Tourism

An apple theme park has been built in the county to meet the consumer's needs. Over 200,000 people have visited the park since its opening. Aiming at building a 'comprehensive demonstrated park of modern agriculture,' it has led a fashion in the course of rejuvenating rural areas. The park can be divided into five parts: the production of apples with good quality, the storage, and trade of apples, Cycle processing, the exhibition of new species and technologies, and leisure agriculture. Sightseeing platforms can be seen in the park, and there is a "golden avenue" for sightseeing. Along the road there are grape windmill corridors, old farm tools exhibition area, and swings. The county government is enriching the projects in the park and improving route identifications. By doing so, the rural tourism in the county can enjoy full development.

3.3.1. A National Agricultural Industry Park Has Been Built

Wanrong county strive to build a national agricultural industry park with distinctive features, highly-concentrated elements, advanced facilities, green way of production, integration of three industries strong ability to promote collective development. the park, with apple industry playing the leading role, covers 6 towns and 84 administrative villages which has a population of 148,000 and covers an area of 375,000 mu. With the Wanrong section of the 209 national roads being the industrial driving road, the planning "one axis and six areas" contains six areas with each has unique functions: modern apple production demonstration zone, modern apple e-commerce gathering zone, modern apple industrial development zone, modern apple chain extension zone, modern apple farming and tourism integration zone, as well as modern apple processing and distribution zone. The park is the only one that is included in the list of national modern agricultural parks in Shanxi province, and early 2019, it became one of the first "national demonstration parks for integrated development of rural industries."

3.3.2. Technological Innovation

Wanrong county has actively established an agricultural mechanization demonstration park and standard mechanized operation model park. Agricultural drip irrigation orchards with an area of 13.4 hectares and micro-jet demonstration park covering an area of 100 hectares have been built. Meanwhile, it has widely applied the internet of things into fruit production, for example, the fruit-tree-claiming service- the smart camera is set on the tree with a sign of claiming hanging on it, which allows the claimer knowing about conditions of the trees on the phone at anytime and anywhere. The county also explores the cultivation-under-tree model, referring to plant vegetables, grass, and herbs suitable to grow in the orchard, and breed poultry, which increases the income of fruit farmers by 30%.

4. SWOT Analysis of the Apple Industry in Wanrong County

4.1. Advantages

4.1.1. Advantageous Natural Environment

Wanrong county is located in the golden delta of Yellow river in Yuncheng, Shanxi, Shanxi Province, with the highest altitude of more than 1400 meters and the apple-producing area of 600-800 meters above sea level. As a part of the loess plateau, the place has blessed conditions for producing fruits, ranging from long sunshine duration, massive temperature difference and abundant mineral substance in soil. It is the best green place in the most suitable area of planting apple with good quality of the world.

4.1.2. The brand-building Have Achieved Initial Success

By hiring researchers from the CRBD researching center for agricultural brands, the county has created the public-owned brand in the apple-producing area called 'A Happy Apple' whose value has reached as high as 3.065 million yuan, ranking the first in Shanxi province. Furthermore, it has cooperated with over 400 Wechat salespeople and e-businessmen both in and out the province to boom online sales. During the China International Trademark Brand Festival 2018, Wanrong apples appeared in the Exhibition of "finding the charm of landmarks", and won the golden prize among 20 participants reflecting its guiding principle of improving quality, creating brand, and following the road of high-end development.

4.2. Disadvantages

4.2.1. Imperfect Integration of chain lines

Even though there is a relatively complete chain of the apple industry in Wanrong county, the chains still can not integrate perfectly. Due to the limited conditions of the county, and the absence of a pleasant environment to attract talents, the graduates from the university prefer to stay at the city in which their school locate .the insufficient use of the agricultural technologies and the low participation of agricultural researchers who do not fulfill their responsibility of supporting the upgrade of the technologies and R &D works has delayed the process of industry integration. The industry also lacks overall planning lead to a relatively low income of the orchard owners. In general, more significant efforts are needed to maximize the interest of the whole industrial chains.

4.2.2. Insufficient Application of Science and Technologies

The workforce still plays a leading role in production because of the insufficient application of mechanization technologies. Furthermore, it is the orchard owner that takes charge of the fresh-keeping work, which causes a severe waste and does damage to apples because of the undeveloped fresh-keeping ability and the absence of advanced technologies. Furthermore, some orchard owners still sell their fruits in traditional ways, and inappropriate information causes low market competitiveness.

4.3. Opportunities

4.3.1. Favorable Policies for Integration of Three Industries in Rural Areas

In recent years, China attaches great importance to the implementation of the policies related to the integration of three industries. The central government has made definite plans in the No.1 document of the coordinated development of the three industries in rural areas for five consecutive years since 2015 and in the *Notification for Promoting Further Development of the integration of Three industries in Rural Areas*, the government dictated a further action. In the central document No.1 in 2019, It also proposed that the local governments should develop industries with rural characteristics in line with their real conditions to enrich the development modes of the integration of three industries in rural areas with the guidance of the document.

4.3.2. The Industrial Cluster Planned the County Government

The Wanrong county government actively supports the development of 90 specialized cooperatives and 6 national, provincial as well as municipal leading enterprises in the fruit industry, and has invested 300 million yuan in the construction of 3 fruit theme parks and 10 demonstration parks of high-quality fruits. It has also built an “apple expo” now can be visited by tourists, The county has promoted the construction of industrial park with vigor by implementing core elements of modern agriculture to the parks and by deepening and expanding their business. By doing so, the radiation effect has been formed, the park has become one with highly integrated three industries.

4.4. Threats It faces

4.4.1. The Fierce Competition in Leisure Agricultural Industry

The Integrated development of agriculture and tourism in surrounding counties has been promoted greatly. For example, Ji county of Linfen city focuses on developing entertainments and county-life-experienced activities based on apple cultivation. And the county is now endeavored to build its first Comprehensive tourism leisure resort before 2020. Under the circumstance of the overall development of leisure agriculture, there is an urgent need for Wanrong county to develop tourist projects with local characteristics. Due to the seasonal growth of apples, the tourism industry has distinct off-peak seasons and low revisiting rates. In the off-season, when tourism products and experience activities are absent, the number of tourists drops significantly, which significantly affects the tourism income of Wanrong county.

4.4.2. The Out-sync Government Services

The ability of the service team from the government can not keep up with the development of the integration of three industries in apple production. Furthermore, the training for orchard works is also far from perfect, which can not meet the demands for the new type of professional workers who have received the proper education, know well about technologies, and are skillful in managing their business. The fruit processing Lacks for a comprehensive standard and management form the government, and there is a consistent standard for the quality. What is more, the marketing system of the apples is relatively closed to the outside world; thus, it can not have a scale effect. However, Apple products in Ji county are now all sold with the same brand, coverage, publication, and marketing, which can promote their brands and at the same time protect them.

5. The Path of Development of Apple Industry in Wanrong county

5.1. The Model of the Whole Industry

The apple industrial chain should be expanded, extended, supplemented, and strengthened, and the upstream and downstream industrial chains of scientific research, deep processing, distribution, tourism, and service will be expanded to promote the integrated development of primary, secondary and tertiary industries. At the same time, Wanrong county government has established a corresponding agricultural information service platform, which covers the whole production chain and various agricultural socialization service platforms, including talents, logistics, trading, finance, brand, science, and technology. (As shown in Fig.1)

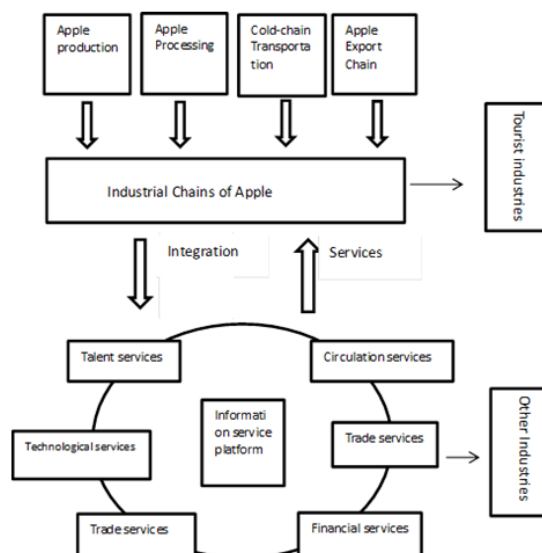


Fig. 1. The Model of the Whole Industry

5.2. The Model of Functional Agriculture

The county should collect the data of tourists by using ‘Internet +’ and ‘big data’ technologies to provide different services for different customers of various ages and demands. It should also diversify the projects in industrial, visiting, natural, and cultural aspects, further improve the theme park, develop the leisure agriculture and promote the upgrade of the apple industry. (as shown in Table 1)

Table 1. Development level

Levels	Model of management
Industrial level	1) Establish a fruit tree adoption area to offer the adopters with the opportunity to experience the planting of fruit trees for a long time 2) Introduce organic apple cultivation techniques and its market system 3) Introduce apple planting technology, cultivation management measures and grafting technology of different varieties
Landscape-level	1) Build orchards with seasonal characteristics, further improve the facilities and environment of theme parks. 2) Introduce unique cuisines of countries around the world, ranging from an American apple pie, French apple cake, British caramel apple, European baked apple, which allow tourists to experience different exotic food culture
Natural and ecological level	1) Introduce the methods of apple planting and management 2) Popularize the organic ways of apple planting, and expand the cultural image to publicize the slogan of Wanrong apple of “producing nature and safe agricultural products 3) Display and introduce the process of evolution of various machines in apple in modern time.
Cultural experienced level	1) Integrate the 24 solar terms and farming civilization into the apple theme park and introduce astronomy, meteorology, farming, and other scientific knowledge. 2) Hold apple festival regularly, and design activities of public interest, such as apple-shaped kite competition apple float parade, and apple music festival.

5.3. The Model of Industrial Cluster

The county should give full play to the advantages of "national modern industrial park," and rely on the development of the core apple industry, to integrate resources, and optimize the industrial structure in the park, forming a distinctive industrial layout. The industrial park must be managed in a comprehensive and standardized way to exert the integration effect. With apple industry being the core, a new diversified mode integrated the production, marketing, trade, industry, and agriculture

will be formed. By doing so, all the aspects can complement each other. Wanrong county should also support the industries to achieve their effective integration. (as shown in Fig. 2)

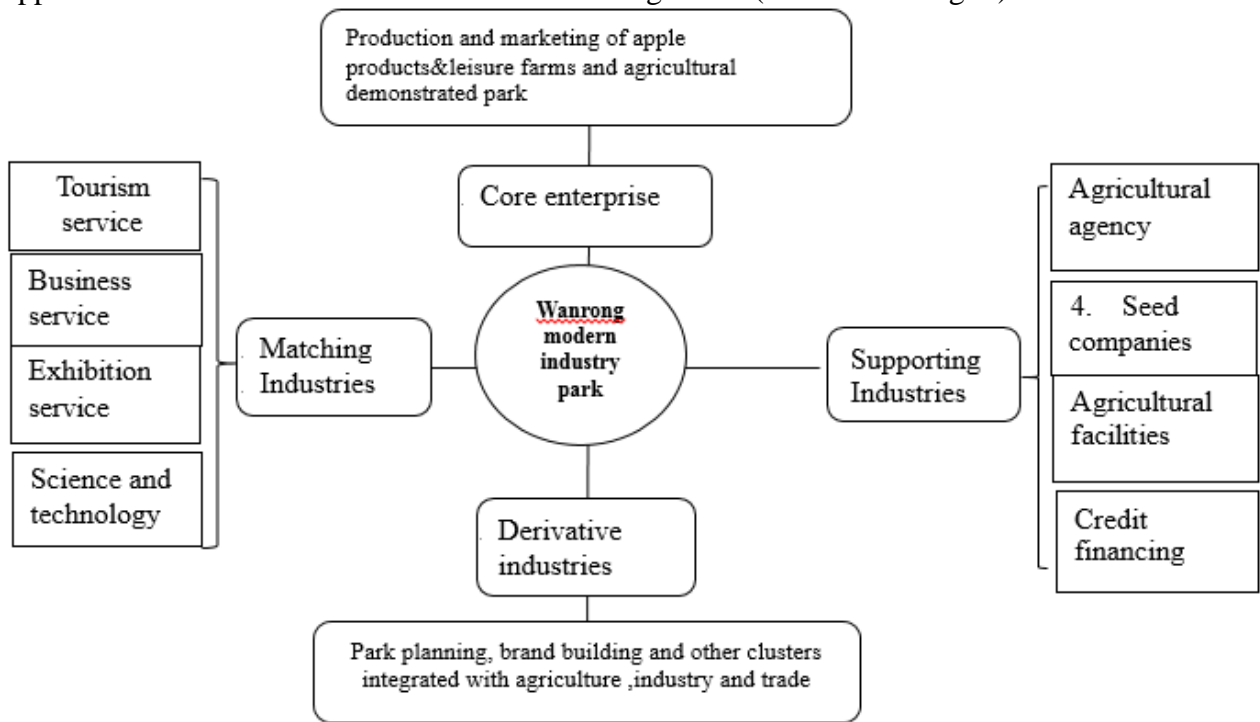


Fig.2 The Model of Industrial Cluster

5.4. The Model of Technology application

In the first industry, various technologies of standardized management and the internet of things should be applied to improve the quality of apples. In the second industry, the county should conduct greenways of processing and promote the application of cold-chain logistics to build a sustainable and circular agricultural system. In the third industry, it is advisable to build an e-commerce model of ‘internet plus agriculture’ and another e-commerce platform such as on-line order and live broadcast activities, which can reduce circulation and cost and meanwhile strengthen popularity as well as rise the income. (as shown in Fig. 3)

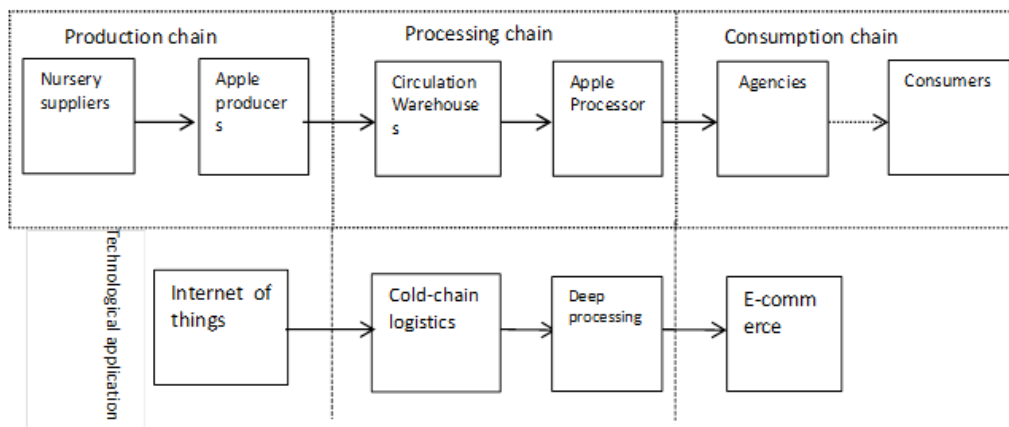


Figure 3. The Model of Technology application

References

- [1] Xiaojun Zhao. Research on the Development of Rural Industrial Integration[P]. Proceedings of the 2019 4th International Conference on Financial Innovation and Economic Development (ICFIED 2019), 2019.
- [2] Yan Peng, Wenbin Liu, Chang Tan. Research on New Urbanization and Agricultural

- Modernization Coordinated Development in the Traditional Agricultural Areas [P]. Proceedings of the 8th International Conference on Social Network, Communication and Education (SNCE 2018), 2018.
- [3] Man Li. Landtransfer and the development of Cooperative Path of the sixth industry[P]. Proceedings of the 2015 International conference on Engineering Management, Engineering Education and Information Technology, 2015.
- [4] Xiaolan Hu,Hui Liu,Jingjun Shu. Research on the Construction of Agricultural Logistics Park Information Platform Facing the Whole Industry Chain[P]. Proceedings of the 2018 International Symposium on Social Science and Management Innovation (SSMI 2018), 2019.
- [5] Chunjiang Zhu,Rujiu Luo. Discussion on the Elements of Modern Agriculture Sustainable Development [P]. Proceedings of the 2018 7th International Conference on Energy, Environment and Sustainable Development (ICEESD 2018),2018.
- [6] Shidi Shao,Yidan Shao. SWOT Analysis of Modern Agriculture Development in Jilin Province [P]. Proceedings of the 2017 International Conference on Society Science (ICoSS 2017), 2017.
- [7] Kathleen Savoie. Boosting Farmer Sales through Point of Purchase Home Food Preservation Education [J]. Journal of Nutrition Education and Behavior, 2018,50(7).
- [8] Fanyu Bu,Xin Wang. A smart agriculture IoT system based on deep reinforcement learning[J]. Future Generation Computer Systems, 2019,99.
- [9] Jhud Mikhail Aberilla,Alejandro Gallego-Schmid,Adisa Azapagic. Environmental sustainability of small-scale biomass power technologies for agricultural communities in developing countries[J]. Renewable Energy, 2019,141.
- [10] P. Paam,R. Berretta,M. Heydar,R. García-Flores. The impact of inventory management on economic and environmental sustainability in the apple industry[J]. Computers and Electronics in Agriculture, 2019,163
- [11] Yi Liu, Jiawen Peng, and Zhihao Yu. 2018. Big Data Platform Architecture under The Background of Financial Technology: In The Insurance Industry As An Example. In Proceedings of the 2018 International Conference on Big Data Engineering and Technology (BDET 2018). ACM, New York, NY, USA, 31-35.
- [12] Zhang Yanjun, Yang Xiaodong, Liu Yi, Zheng Dayuan, Bi Shujun. Research on the Frame of Intelligent Inspection Platform Based on Spatio-temporal Data. Computer & Digital Engineering [J], 2019, 47(03): 616-619+637.