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# Practice and Exploration of New Rural Construction in West Bank of Taiwan Strait Led by Spark Science and Technology

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**Abstract** According to practice and exploration of spark program for 26 years in Quanzhou, the main model and their effects of new rural construction in west bank of Taiwan Strait led by spark science and technology were expounded. Six spark program systems were established, consisting of policy support guide, science and technology project lead, experts' intelligence support, spark science and technology training, sci-tech information service and spark program demonstration. Five spark projects were implemented to promote new rural construction in the west bank of Taiwan Strait, such as constructing the national spark industrial zone, organizing the new rural construction led by science and technology, constituting spark sci-tech innovation center, developing the rural informatization, and establishing science and technology commissioner bases. Finally, enlightenment of spark program and its development ways in the future were put forward.

**Key words** Spark science and technology, Support and leading, The west bank of Taiwan Strait, New rural construction

Spark program approved by Chinese government in 1986 aims to promote rural economy growth depending on scientific and technological progress and to make farmers rich through popularization of science and technology<sup>[1]</sup>. In 2009, the Chinese State Council supported Fujian Province constructing an economic region in west bank of Taiwan Strait, and Quanzhou City is one of three key central cities in west bank of Taiwan Strait. Since 1986, taking facing rural development as the main track and spark program as the carrier, Quanzhou Technology Bureau of Fujian Province has established six spark program systems, consisting of policy support guide, science and technology project lead, experts' intelligence support, spark science and technology training, sci-tech information service and spark program demonstration. Meanwhile, the bureau has implemented five spark projects to promote new rural construction in the west bank of Taiwan Strait, such as constructing the national spark industrial zone, organizing the new rural construction led by science and technology, constituting spark sci-tech innovation center, developing the rural informatization, and establishing science and technology commissioner bases. In 2012, gross domestic product (GDP) of Quanzhou City reached 472.65 billion yuan, continuously taking the first place over the past 14 years in Fujian Province. Moreover, Quanzhou City is chosen as the advanced city continuously in scientific and technological progress over the past 15 years; Quanzhou Technology Bureau and Quanzhou Science and Technology Development Center were awarded the advanced collectives in national spark technology work,

and 27 people were awarded the advanced workers in national spark program or won the "Jinqiao Prize of Agriculture Technology Services"<sup>[2]</sup>. In this paper, according to practice and exploration of spark program for 26 years in Quanzhou, the main model and their effects of new rural construction in west bank of Taiwan Strait led by spark science and technology were discussed to provide references for using spark science and technology to promote new rural construction during the "12th Five-year Plan" period.

## 1 Establishment of spark program systems

Facing agriculture, rural areas and farmers, Quanzhou City has established six spark program systems and implemented five spark projects (Fig.1) since 1986 to promote new rural construction in west bank of Taiwan Strait.

**1.1 Policy support guide** In 2000, Quanzhou City Government established the Leading Group for the construction of the National Spark Industrial Zone in Quanzhou Bay, and the mayor is head of the group. A series of sci-tech policies, development plans and implementation programs were proposed one by one to make spark program of Quanzhou City develop orderly and sustainably, such as the Temporary Provisions for Strengthening the Construction and Management of Areas with Intensive Spark Technology, Development Plans of Agricultural Cooperation Experimental Zones in both banks of Taiwan Strait (Quanzhou) and so forth.

**1.2 Science and technology project lead** From 1986 to 2012, Quanzhou Technology Bureau had implemented 1 737 spark programs and agricultural sci-tech plans in total. Among them, three projects were classified as the national support programs, such as "Deep processing technology integration and industrialization demonstration of low-value fish in sea" and "Research and demonstration of key technology controlling food quality and safety". Eight projects were ranked as the national special action plans for making farmers rich by science and technology, and seven projects were chosen as the national project for transforming agricultural

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scientific and technological achievements. These science and technology projects can support and lead the development of modern

agriculture of Quanzhou City and new rural construction in west bank of Taiwan Strait.

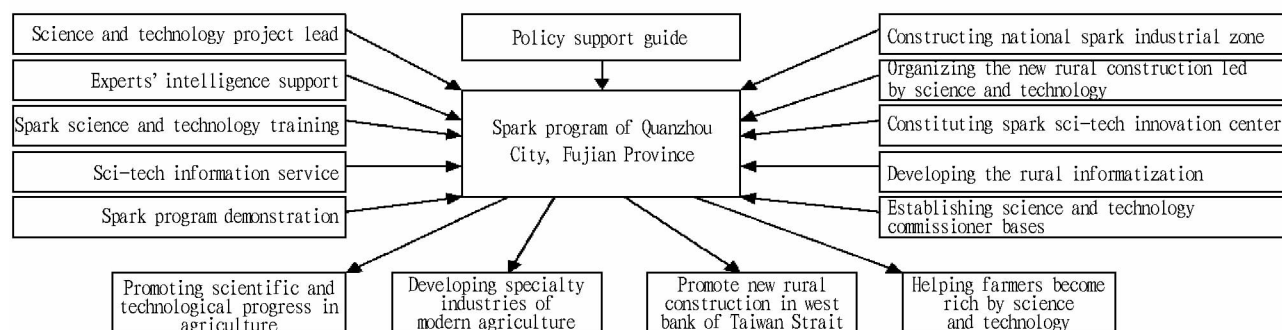


Fig. 1 Spark program systems and projects of Quanzhou City

**1.3 Experts' intelligence support** During 2005 – 2011, Quanzhou Technology Bureau employed 220 experts and professors from research institutions and universities of Fujian Province to set up an expert group for rural areas of Quanzhou City and the entrepreneurial team of science and technology commissioners<sup>[5]</sup>. They were divided into 18 groups, and expert database was established to provide experts' intelligence support for the implementation of spark program as well as remote science and technology training and consulting services.

**1.4 Spark science and technology training** During the "Eleventh Five – year Plan" period, the government built 24 spark schools, established 130 terminals for rural science and technology remote video training platform system, set up a rural science and technology group composed of more than 200 teachers and experts in Quanzhou City, made 45 rural practical technology videos and more than 150 multimedia coursewares, and compiled and printed more than 30 000 volumes of spark technology training series composed of above 10 kinds. In addition, more than one million people from the west bank of Taiwan Strait (Quanzhou) were trained to improve farmers' ability to get rich depending on science and technology and migrant workers' employment skills<sup>[4]</sup>. Quanzhou Science and Technology Development Center won the Science and Technology Progress Prize and Jinqiao Prize of Agriculture Technology Services.

**1.5 Rural sci-tech information service** Since 2007, Quanzhou Science and Technology Development Center has set up rural sci-tech information service system (in the city, a county, town, village, farmer cooperative and sci-tech demonstration household) led by Quanzhou Rural Sci-tech Information Service Center; more than 1 000 information service sites and demonstration bases have been built in Quanzhou City, and there are above 2 000 rural information assistants to informationize rural areas<sup>[5]</sup>.

**1.6 Spark program demonstration** Centering on constructing the national spark industrial zone, making farmers rich by spark science and technology, organizing the new rural construction led by science and technology, establishing science and technology commissioner bases and developing rural informatization demonstration projects, taking spark program and agricultural science

and technology projects as the carrier, Quanzhou City has established the spark program demonstration system composed of science and technology commissioner bases, rural informatization bases and so forth.

## 2 Implementation of spark projects

**2.1 Constructing the national spark industrial zone in Quanzhou Bay** During the "Tenth Five-year Plan" period, Quanzhou City built 12 regions with intensive spark technology, and annual output value reached 68.2 billion yuan, with foreign currency earnings of 1.09 billion dollars. In 2000, the city began to set up spark industrial zone along Quanzhou Bay, covering 11 counties (cities and districts). The spark industrial zone was classified as one of three national spark industrial zones in 2002, and then it was chosen as the national spark industrial zone in economic area in west bank of Taiwan Strait in 2006. Besides, the city has implemented "10813" project, built ten regions with intensive spark technology, eight major spark industries, one agricultural sci-tech cooperation experimental zone between both sides of Taiwan Strait, and three spark regional mainstay industries to promote the construction of a well-off society<sup>[6]</sup>.

**2.2 Constituting spark sci-tech innovation center** Quanzhou City strongly supports the building of spark sci-tech innovation centers in the form of funds. Until 2011, there were 150 spark industry (business) technology innovation centers. Among them, there were ten national, 65 provincial level centers. These centers refer to electronic information, machinery, chemicals and other dominant industries, and provide product research and development, achievements transformation, personnel training, technical advice and information services for enterprises in townships, improve technology innovation capability, and promote the development of regional specialty industries<sup>[7]</sup>.

**2.3 Organizing the new rural construction led by science and technology** From 2006 – 2011, Quanzhou Technology Bureau firstly organized the new rural construction led by science and technology. In the city, 0.59 billion yuan was invested to mainly construct 21 demonstration towns, 42 demonstration villages, 114 farms and 210 households. In addition, it built 64 provincial and

city – level industry technology development centers, 57 science and technology commissioner bases, 133 rural professional and technical associations and farmer cooperatives, and 432 rural information service sites. Meanwhile, it implemented 1 242 science and technology projects and agricultural "five new" projects, cultivated 46 high-tech enterprises, and won 82 science and technology awards at all levels. In 2010, gross output value of industry and agriculture in the 21 demonstration towns was up to 102.88 billion yuan, and tax revenue reached 5.42 billion yuan, while farmers' per capita net income was 9 313 yuan, which increased by 73.0%, 166.4% and 40.5% respectively compared with 2006.

**2.4 Implementing rural informatization demonstration project** Since 2003, Quanzhou City started to implement rural informatization demonstration project and built eight rural informatization demonstration counties (cities and districts). During the "Eleventh Five-year Plan" period, it focused on rural informatization demonstration project centering on Quanzhou rural sci-tech information network, 12396 multimedia information remote service platform of Quanzhou spark program and "Century Village" rural information service platform<sup>[8-9]</sup>. Quanzhou rural sci-tech information network was open to the public in 2004, and total quantity of people visiting the website reached 0.45 million. In 2007, "Spark program" channel on network TV was firstly set up in Fujian Province, and there were more than 80 000 households owning network TV, while there were 0.3 million people choosing spark program channel. Since 2008, Quanzhou Technology Development Center has implemented 12396 information services pilot, and established 12396 multimedia information remote service platform of Quanzhou spark program composed of hot-wire telephone, automated voice inquiry system, the Internet, video system, network television, mobile short message and QQ group. The city set up a rural science and technology expert group composed of 220 experts, made rural practical technology science films and multimedia coursewares, organized remote scientific and technical training and consulting service, which has promoted new rural construction in west bank of Tainwan Strait and has obvious social benefit<sup>[10]</sup>. "Century Village" rural information service platform was set up by "Century Village" Group in 2008, and it has been applied in many villages of Fujian Province, with good social and economic benefit, and it was awarded national advanced rural information service station and won the Third Prize for Technological Invention of Fujian Province.

**2.5 Establishing science and technology commissioner bases** In 2010, Quanzhou City Government established five-year implementation plan for science and technology commissioner work. It aimed to mainly support the building of ten sci-tech commissioner entrepreneurship chain, ten science and technology demonstration zones and ten industrial technology innovation and strategic alliances, build 100 science and technology commissioner bases, implement 100 main science and technology projects, and develop 100 professional cooperatives in rural areas. In addition, it will set up an entrepreneurial team composed of 1 000 science and tech-

nology commissioners, cultivate 1 000 peasant technicians to serve 1 000 enterprises, spur 10 000 graduates and 10 000 migrant workers to get a job, and train 1 000 technicians. Until 2011, there were 205 science and technology commissioner bases, set up Quanzhou science and technology commissioner information network, implemented more than 100 projects, obtained more than 15 million yuan of funding for science and technology projects, which had promoted new rural construction in west bank of Taiwan Strait. Four institutes including Quanzhou Institute of Agricultural Sciences were awarded the advanced collective in science and technology commissioner work and national "Rural Technology Service Jinqiao Prize", and 13 people were chosen as national and provincial excellent science and technology commissioners and advanced individuals of "Rural Technology Service Jinqiao Prize"<sup>[3]</sup>.

### 3 Implementation effects of spark program

#### 3.1 Improving agricultural science and technology level

From 1986 to 2012, Quanzhou City implemented spark program and agricultural science and technology projects, which obviously improved agricultural sci-tech level of Quanzhou City. Moreover, it won 395 prizes for the achievements in science and technology, including two national prizes, seven ministerial prizes, 106 provincial prizes and 212 city-level prizes. Among them, a new variety of wheat "Jinmai 2148" has been planted in 3.87 million hm<sup>2</sup> of land in above ten provinces (districts), and the increase of grain yield reaches 1.20 million tons, while farmers' income can be increased by 0.37 billion yuan. Meanwhile, the city built three national comprehensive experimental stations of agricultural technology system for peanut, tea and orange.

#### 3.2 Developing specialty industries of modern agriculture

With the aid of spark program, Quanzhou City has developed some specialty industries, such as Quanzhou sea fishery, Anxi tea, Yongchun ponkan, Quanzhou longan and so forth. Implementation of science and technology projects has promoted the sustainable development of new blue industry in Quanzhou. In 2011, total yield of marine aquaculture reached 1.006 2 million tons, and total output value of marine fishery was up to 9.3 billion yuan, containing 6.79 billion yuan of output value of marine product processing. Taking spark program as the carrier, Anxi County develops Tieguanyin tea industry, and it had 40 000 hm<sup>2</sup> of tea garden in 2012, and annual yield of tea reached 65 000 tons. Moreover, total output value of tea industry exceeded 10 billion yuan, in the first place among major counties producing tea in China. Additionally, Anxi County was chosen as the national agricultural industrialization demonstration base, organic product certification demonstration area, agricultural product quality and safety demonstration area and tea sci-tech innovation demonstration county.

#### 3.3 Promoting new rural construction in west bank of Taiwan Strait

Using informatization to promote new rural construction is a creative highlight of Quanzhou City. Since 2006, Lantian Village, Nan'an City has built Nan'an New Farmer Training School

### 3.4 Helping farmers become rich depending on science and technology

Implementation of spark program can improve farmers' ability to increase income relying on science and technology. In 2012, farmers' per capita net income was 11 915 yuan in Quanzhou City, 1.5 times as higher as farmers' per capita net income of China (7 917 yuan). Anxi County implemented spark program to make farmers rich, and it developed specialty industries like Tieguanyin and Wulong tea. Annual per capita net income of tea farmers was more than 10 000 yuan, and tea farmers whose annual per capita net income exceeded 0.1 million yuan accounted for 30%. Dehua County also implemented spark program to promote agricultural development, and built 310 farmer cooperatives, developed agricultural specialty industries to spur 18 000 households to increase income, and its output value reached 0.506 billion yuan in 2012.

Quanzhou City of Fujian Province has implemented spark program for 26 years, and the program has play an important role in new rural construction in west bank of Taiwan Strait. Practice shows that spark program is an effective way and an important platform for agricultural sci-tech work, and it leads and promotes new rural construction. The "Twelfth Five-year Plan" period is the key to the building of a well-off society in China and the development of modern agriculture. The fundamental way out for agricultural development lies in scientific and technological progress, so we must insist on prospering the agriculture with science and education and

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