



## The Experience and Enlightenment of Financial Support for Rural Science and Technology Entrepreneurship in Developing Countries

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### Abstract

The development of science and technology in rural areas contains a very wide range of contents, including the development of science and technology in agricultural production, and the scientific and technological progress in agricultural life. Not only the development of science and technology in traditional agriculture, but also the development of science and technology in the second industry and the third industry in rural areas. Capital markets and financial institutions in various countries are different, and the corresponding ways to support the development of rural science and technology are not the same. Select Bangladesh and India, two developing countries as the more typical case, summarize the financial support of rural science and technology innovation in the successful experiences and lessons, analyze its Implications for Chinese financial support for technology entrepreneurship in rural areas. The financial support for the improvement of rural science and technology entrepreneurship is of great significance.

**Key words:** Financial support; Rural areas; Science and technology entrepreneurship; Developing countries

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### INTRODUCTION

Since the industrial revolution, the elements of science and technology in agricultural production and business activities have become more and more obvious. But agricultural production cannot accurately predict due to its natural risk. Rural science and technology entrepreneurship also has a huge risk of science and technology. Therefore, countries continue to explore the process of rural science and technology in the process of financial policy system design, government roles and risk control, etc. Innovative financial instruments to encourage rural technology entrepreneurs, reduce the risk of the main parties, reduce the cost of financing, innovative financial instruments, to encourage technological entrepreneurship in rural areas, reducing the risk of the main parties and financing costs. This paper combs the rural basic endowment of the developing countries (Bangladesh and India) and the financial instruments that support the innovation of the rural science and technology innovation in the last hundred years. Compare and learn from the mature operation experience, to provide reference for our country’s rural science and technology entrepreneurship financial policy.

### 1. FINANCIAL MEASURES TO SUPPORT RURAL SCIENCE AND TECHNOLOGY ENTREPRENEURSHIP IN BANGLADESH

Bangladesh is one of the world’s 46 least developed countries, nearly 69 percent of the population live in rural areas, and nearly half of the population living below the poverty line, weak economic foundation, backward productivity, economy mainly depends on agriculture. Since the 1970s Bangladesh independence, in order to eradicate poverty and promote rural economic development, microfinance started a pilot, after decades of development, aimed at poverty reduction and one of the main business of micro-finance its financial system has become Elimination not only provides for the elimination

of poverty and the promotion of rural economic development of the rich financial support, but also became the bank profit model of innovation.

### 1.1 Support the Financial Service System of Rural Science and Technology Entrepreneurship

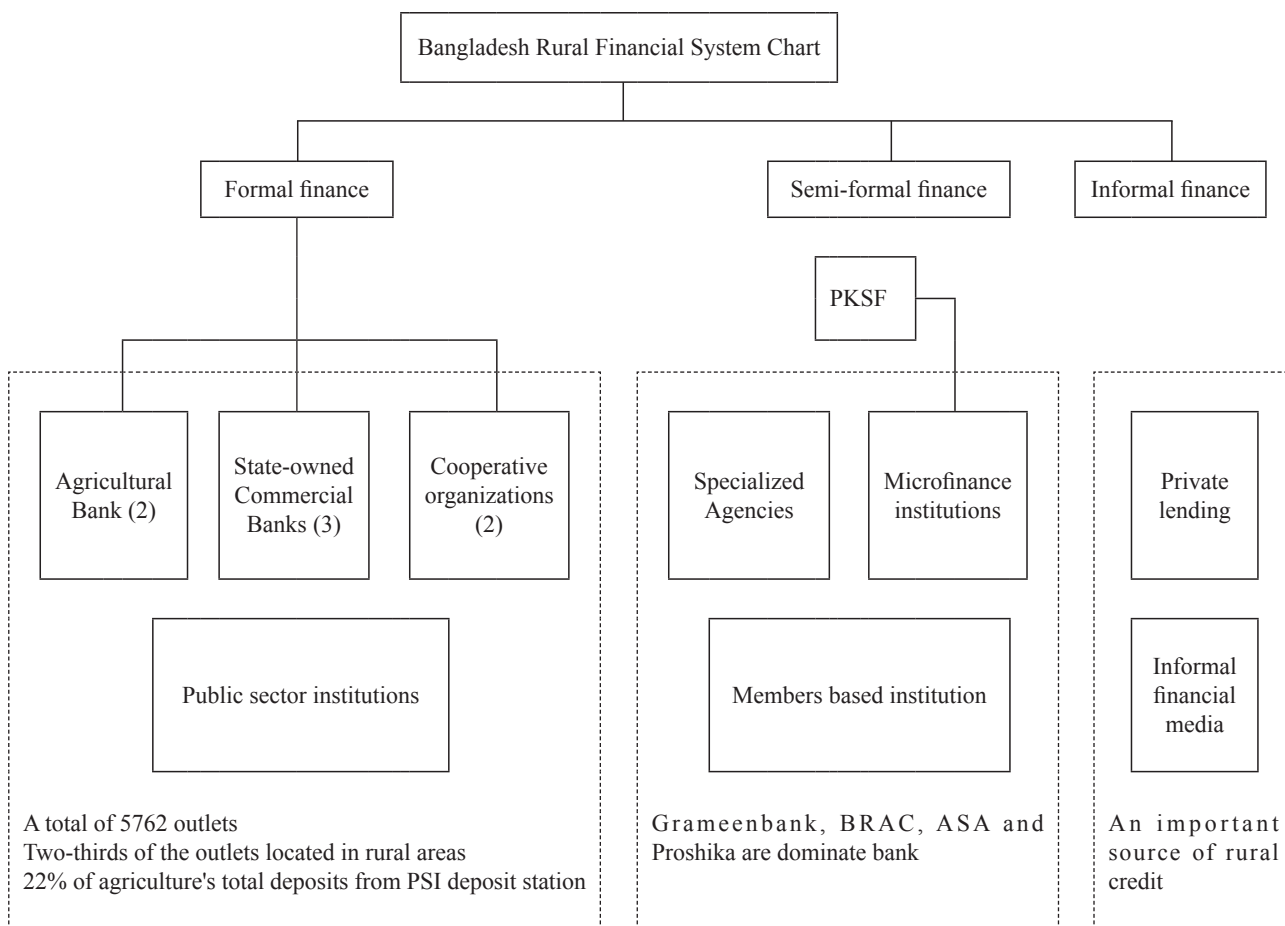
Bangladesh affected by conditions of poverty, limited agricultural country, its financial system and financing environment is more specific to microfinance as the main product of micro finance to develop vigorously, while the formal financial system development is poor. The rural financial system of Bangladesh consists of formal finance, informal finance and informal finance (see Figure 1), Bank Bangladesh, which is the central bank, is responsible for supervising the operation of financial institutions. The rural financial institutions mainly include: ① agricultural development bank, including Bangladesh Krishi Bank and Rajshahi Krishi Unnayan Bank. ② commercial bank, including three state-owned commercial banks Sonali, Janata, Agrani, and private commercial banks. ③ A Samabaya Bangladesh Bank Ltd., and two cooperative organizations, Cooperative Land Mortgage Bank and Central Cooperative Banks. ④ Grameen Bank. In addition to these institutions, some official and semi-

official professional organization is also committed to promoting the development of rural finance. For example, Bangladesh Rural Development Board and so on.

### 1.2 Major Microfinance Institutions in Bangladesh

#### 1.2.1 Specialized Agencies—GB (Grameen Bank)

Grameen Bank has translated into rural banks, set up by Professor Muhammad Yunus in 1974 Bangladesh famine occurred after a microfinance specialized agencies. In 1976, the village bank was founded in the village of Jobra in Bangladesh, which allowed it to be registered as a bank in 1983. Over the next 30 years, from \$ 27 credit paltry difficult start to become nearly 6 million borrowers, 2,185 branches, 18,151 employees, up 98.89% repayment rate of micro-financial institutions. Up to now, a total of \$ 5.3 billion of lending to help the four million poor people out of poverty-reliance, and to maintain a nine-year record of profitability, to achieve the dual goals of poverty alleviation and financial sustainability. GB model has been successfully replicated and promoted in more than 100 countries around the world, it makes to millions of poor people out of poverty. Yunus, founder of GB, was awarded the 2006 Nobel peace prize.



**Figure 1**  
**Bangladesh Rural Financial System Chart**

### **1.2.2 Wholesale Credit Institutions—Rural Employment Support Foundation (PKSF)**

PKSF was founded in May 1990, it is the only capital of a wholesale microfinance institutions funded by the Government of Bangladesh. They do not directly provide loans to the poor, but by providing money to their partners to help the poor. It not only provides funds, but also pay more attention to helping partners to strengthen institutional capacity building. PKSF's partners not only include qualified non-governmental, semi-governmental, but also include government agencies, voluntary agencies and bodies as well as local government agencies, they are generally divided into two categories, one is a national large institutions; another class is endemic in small organizations.

PKSF's goal is to create employment opportunities through the landless, no assets to provide resources to improve the economic situation, and ultimately eradicate poverty and raise living standards. The main functions of PKSF include: To provide support and assistance in finance, organization, consultation, and training to the organization and government organization, as a non-governmental organization. Providing employment opportunities, education and technical training for the poor, providing strong financial support to cooperative organizations, to enhance their ability to provide resources for the poor, by providing employment opportunities for the poor to enhance their capacity for self-reliance, promote the improvement of their quality of life.

As one of the world's largest and most successful microfinance wholesale institutions, PKSF has played a very important role in promoting the development of micro finance in Bangladesh. PKSF is a non-profit company. Its main source of funding contributions from the Government of Bangladesh, a variety of organizations and institutions, including the World Bank, the Asian Development Bank, IFAD (International Fund for Agricultural Development), etc.

### **1.2.3 Non-governmental Organization of Microfinance Institutions—Rural Advancement Committee (BRAC)**

Rural Advancement Committee (BRAC) is the largest of the country's non-governmental organizations established in 1972. It aims to eliminate poverty and improve the ability of the poor. After twenty years of continuous development, BRAC's work content from the initial solution to the refugee problem as rescue aid poor. At the same time, the committee is also committed to the implementation of micro credit and modern multi security network measures. In Bangladesh, for example, microfinance is mainly for farmers in poor areas, with particular emphasis on women as the main target of the loan.

## **1.3 The Successful Experience of Microfinance in Bangladesh**

### **1.3.1 The Concern and Support of the National Financial Policy to the Poor Peasant Households**

In the concern for the poor and the rural economy, the founder of the GB and other financial institutions to

provide loans specifically for the poor, GB has become the world's most efficient microfinance services for the poor organization. The government's support is reflected in the government's guiding role in microfinance. In the initial capital of GB, 60% is provided by the government, the main way to raise funds is to issue bonds and to absorb the member deposits through government guarantees. PKSF funded by the government of Bangladesh to establish wholesale credit institutions, by providing funding to partners way to help rural areas to achieve economic development.

### **1.3.2 Innovative Financial Management System, and Fully Mobilize the Forces of All Parties**

The long-term coexistence of the formal financial sector and the informal sector is a major feature of the current financial markets in many developing countries. Because informal finance has the advantages of small scale, convenient loan, low degree of information asymmetry, low cost and fast speed, it plays an important role in the rural entrepreneurship of Bangladesh. While in China, there is strict controls for the respective NGO and other financial institutions.

### **1.3.3 To Meet the Special Needs of Rural Science and Technology Entrepreneurship**

Bangladesh financial institutions not only to provide small loans to farmers, but also to provide investment information services to farmers, providing technical and personnel training, and fundamentally improve the entrepreneurial capacity of farmers. The function of the rural employment support is not only to provide funds for the poor, but also to provide employment, education and technical training opportunities for the poor. By providing employment opportunities for the poor, and enhancing their ability to self-reliance, and promote the improvement of their quality of life, and so on. Therefore, the support of rural financial institutions to agricultural science and technology entrepreneurship, not only from the characteristics of agriculture to support agriculture, but also to jump out of the traditional financial model to support agriculture.

### **1.3.4 Sustainable Development of Micro Financial Institutions**

Sustainable development of micro financial institutions in Bangladesh is also a very valuable experience. Such as the commercial operation of the GB, while using market interest rates of loans to the poor, farmers absorb shares. As well as poor absorption of deposits through higher deposit rates, so that the poor get a higher interest income, also can provide some protection when they need loans. Through these measures, so that the GB continuous profit and achieve sustainability of development. PKSF is also gradually achieving financial sustainable development, and gradually reduce the dependence on foreign funds. PKSF's interest income can compensate for the direct operating costs (such as wages and management costs), to ensure the sustainability of the business. Recent statistics show that the total expenditure of the NGO microfinance

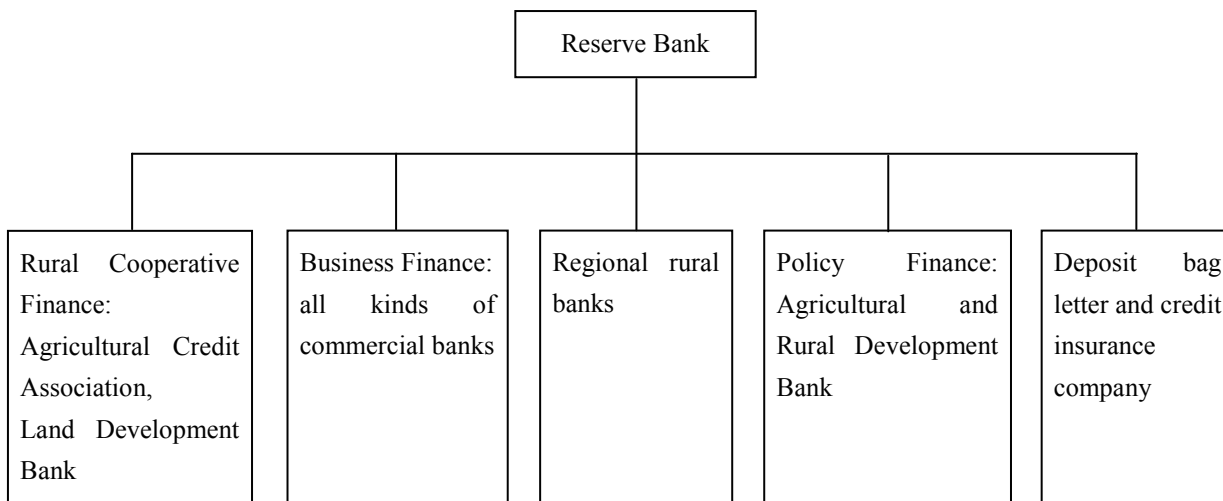
institutions, mostly from business income, only about 20% rely on donations.

## 2. FINANCIAL MEASURES TO SUPPORT RURAL SCIENCE AND TECHNOLOGY ENTREPRENEURSHIP IN INDIA

### 2.1 Support for the Financial Service System of Rural Science and Technology Entrepreneurship

In order to adapt to the development of the national

economy, especially to meet the needs of the development of the rural economy, the rural financial system has been set up in India. India's rural financial system can be summarized as "6 + 1" lead bank model. It is defined by the Reserve Bank of India (India's central bank, responsible for coordination and supervision), the Indian commercial banks, agricultural credit associations, regional rural banks, land development banks, national agricultural and rural development banks, deposit insurance and credit insurance companies constitute, and rural Bank plans to implement the lead. See Figure 2.



**Figure 2.** India's "6 + 1" Rural Financial System

### 2.2 India Government to Promote the Financial Support of Rural Science and Technology Entrepreneurship

India government to promote financial support for rural science and technology to promote the development of rural financial development in the context of several major initiatives. It is mainly to expand the bank branches in rural areas, the proportion of loans to the priority sector and rural comprehensive development plan and a series of initiatives. India rural credit demand is mainly satisfied by lenders and other informal lenders. For the development of the rural economy, government provide financial support in India's green revolution. During 1969-1980, India have nationalized 19 private banks. After government control of them, state-owned banks can carry out construction work in rural outlets directly. In addition to the direct control of state-owned banks, the India government also requires private banks and foreign banks increase rural outlets. Due to the high risk of rural credit, in order to encourage and facilitate financial institutions in the rural financial market, India has also established a deposit insurance and credit insurance company, which by formal rural credit provided by financial institutions to provide insurance.

### 2.3 Microfinance and Self-help Groups in India

Bangladesh's GB model is a successful cases in microfinance. India absorbed GB model and made a promotion. In

1992, NABARD announced a Self Help Groups and Bank Linkage Program Cooperation plan. NABARD through its employees and partners (also known as mutual promotion agencies, such as the primary commercial banks, credit cooperatives, farmers cooperation organization, NGO, quasi government agencies). The farmer self-help groups composed of several farmers built social mobilization and group training. Providing further loans to support small loans provided by commercial banks grassroots. The combination of India agricultural development bank and the non-regular peasant household self-help group, which reflects the characteristics of the formal financial institutions and the model of the self-help groups of farmers. In terms of regulation, the India reserve bank allows the bank to lend to the self-help group, and the self-service group accepts the deposit of its members. In addition, the India Reserve Bank also lifted its interest rate restrictions on them.

Self-help groups generally consist of 10-20 poor informal groups, members have similar social and economic backgrounds, and are faced with similar difficulties through groups that can help each other. Self-help groups first asked members of voluntary savings and providing small loans to the members who needed. The bank's loans to self-help groups are unsecured and are generally 1-4 times of self-service group bank deposits. The interest rate of the loan is entirely determined by the

bank itself. Self-help groups improve rural savings, reduce transaction costs, as well as a high rate of repayment, the repayment rate of up to 97%. Puhazhendhi (2000) points out the advantages of using the group-lending model in the microfinance institutions in India. An important feature of the group-lending model is the use of group security instead of mortgage, with the same pressure as the other members of the group as a factor in the incentive loan

## **2.4 The Experience of Financial Support for the Development of Rural Science and Technology Entrepreneurship in India**

### **2.4.1 A Relatively Complete Financial Support System**

The rural financial system in India has a distinct hierarchy. The financial institutions have a clear division of labor and cooperation with each other and meet the different levels of India agriculture and rural science and technology entrepreneurship development of financial needs. First, the Agriculture and Rural Development Bank of India as an agricultural policy bank, had better promote the commercial financial institutions to improve rural financial services support and guidance functions. Second, pay attention to play the role of state-owned commercial banks in supporting agriculture. Third, the implementation of rural finance “lead bank” plan, which makes every place has a leading bank in charge.

### **2.4.2 Specified the Rate of Priority Sector Lending, to Support Agricultural Development**

In order to provide financial support to the rural areas of the country, the government of India has stated that the net lending of state-owned banks for priority sector should not be less than 40%, foreign banks should not be less than 32%. These priority sectors include agriculture, small business, export industries, etc. This initiative to meet the funding needs of agriculture, effectively promote the development of agriculture and rural areas in India.

### **2.4.3 Innovation “Self-help Group Contact Plan” to Develop Micro Credit**

Microfinance generally refers to providing financial services to low-income groups to help the poor increasing their income, getting rid of poverty. It has a dual financial and social attributes. The bank contact program, which provides loans to the self-help group, also provides social mobilization and technical training for farmers’ self-service organizations, and provides the development plan for them. Self-help groups get the loans from commercial banks, and re-lending to farmers so that commercial banks face a group. Shifting the cost of screening customers and monitoring to other groups. This can effectively spread the risk, and the financial institutions by reducing transaction costs.

## **2.5 What Can We Learn from India Financial Support for Rural Science and Technology Entrepreneurship**

In order to expand rural bank branches, forcing commercial banks to rural distribution, leading to a decrease in bank

operating efficiency. In addition, the financial crisis began in the early 1990s, forcing the government of India to start from a centralized planned economy into a market driven market economy. Based on efficiency considerations, commercial banks began to reduce its rural outlets. The rural comprehensive development plan also includes 50% to 25% of the credit loan funds, which is actually a form of debt relief. Most of the project participants and experts believe that the practice of borrowing and subsidies are not worth promoting. Adams (1984) summarizes four common problem in many developing countries adopt discount loans for poverty alleviation mode. First, the interests of poverty alleviation loans policy generated part of the non-poor people. Second, poverty alleviation loans due to low repayment rate. Third, the subsidized loan policy distortions configuration rural financial resources, hindering the development of the rural financial market. It is not conducive to the poor areas alleviating the normal financial order. Last but not the least, because of discounting loan may not exist for a long time, not all of the interest subsidy loan policy could become a sustainable way to solve the poor funds shortage.

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## **CONCLUSION**

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### **(a) Better Rural Technology Entrepreneurship Financial Service System**

In spite of the different conditions of the developing countries, the financial system of them to support rural science and technology is perfect. They not only have policy based financial institutions, but also have the nature of rural cooperative financial institutions. As well as a variety of commercial financial institutions and private lending. They complement and promote each other to provide financial support for the development of rural science and technology entrepreneurship. Governments dominated by the agricultural policy finance occupy a pivotal role in supporting the technological development of rural financial system. In the development and construction of the rural financial system in Bangladesh, the government always plays a leading role. India’s rural financial system also has the characteristics of its strong national support. Governments will also develop cooperative financial organizations as the focus of rural finance, and provide a series of policy measures for the cooperative financial organizations, such as financial grants, tax breaks, subsidized credit, insurance policies and special industry run policies. Commercial finance plays an important role in rural financial service system.

### **(b) Government Creating a Favorable Environment for the Financial Support of Rural Science and Technology Entrepreneurship**

Since agriculture has inherent inferiority, its ability to attract capital is relatively weak. Therefore, the financial institutions that provide financial services for

the development of agricultural science and technology enterprises cannot be separated from the strong support of the government. Governments respond appropriately to provide support for the development of agricultural science and technology enterprise. First, providing credit services through policy-oriented financial institution directly for agricultural science and technology enterprises. Second, developing a series of preferential policies to support the development of rural science and technology for financial institutions. These preferential policies mainly include the provision of small loans, guarantees, tax incentives, interest subsidies, etc. For example, Bangladesh government set up a special micro credit institutions and domestic and foreign institutions to carry out a variety of micro credit projects. Having solved small credit institutions funding problems, promoting the micro credit industry standards and practices. India government to take the implementation of interest subsidies and credit exemption for rural credit. The national priority development of industry to implement a unified preferential lending rate of 9%, and the difference between the market interest rates by government subsidies and so on.

#### **(c) Diversification of Rural Science and Technology to Support Business Development Financial Institution Financing**

In order to better serve the development of rural technology enterprises, financial institutions must ensure that there is sufficient funds. Foreign countries have a relatively large source to provide financial services for agriculture, so as to support the development of rural technology enterprises to provide sufficient development funds. This will provide sufficient development funds for the development of rural science and technology enterprises.

In addition, it can also borrow money from the central bank or other institution, such as Bangladesh, India, agricultural credit institutions can borrow money from the central bank to expand financial strength. At the same time, it can also lend from foreign countries, including international financial institutions such as the World Bank, foreign governments and foreign financial institutions, etc.

#### **(d) Flexible Financial Control Policy**

From Bangladesh and Indian financial support to rural entrepreneurs can be seen, especially informal financial, especially microfinance has played a very important role. Bangladesh's GB model and India's self-service groups have been proven to be able to better meet the needs of rural entrepreneurship financing. But these two models are required flexible regulation, such as the cancellation of the mortgage, innovative loan guarantees and interest rate deregulation. Mackinnon, an American economist, has put forward the theory of "financial repression", and that there is a serious "financial repression" policy in developing countries. Under the condition of insufficient supply of financial services of the normal financial institutions in

the rural financial market, the financial demand of the rural science and technology venture is mainly dependent on the non-formal finance. So we can learn from their relatively successful experience, liberalize the financial control in rural areas. On the one hand, relaxed financial regulation can relax interest rate control, allowing supply and demand determine the level of interest rates. On the other hand, open access to financial institutions, so that private capital, branches fraternity, rural credit cooperatives, small and medium banks and state-owned commercial banks can coexist. Finally, we should also encourage private financial innovation behavior, and constantly innovate to meet the needs of rural science and technology venture capital financing.

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