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Trends of Project Funding in Provincial-Level Agricultural Research Institutions in China and Recommendations for Fund Management

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Abstract

With the increasing attention of both central and local governments to agricultural science and technology activities in China, according to the survey on an academy and its 3 institutes, the funding of projects in provincial agricultural research institutions has a rapid growth in total amount, significant changes in sources and structure of funds, varied fund management methods and diversified project organization. However, there are problems of disconnection between fund management and project management, budget preparation and actual demand, asset management and financial supervision and project expenditure and scientific research realities. Given these characteristics and existing problems, we recommend the establishment of an improved financial management system, standardized management of scientific research funds, scientific budget planning, enhanced fund use efficiency, appropriate management tools for project funds and strengthening of fund supervision and management.

Keywords: project fund, financial management, budget preparation, agricultural institute, China

1. Introduction

Provincial-level public agricultural research institutions are a major force in China's agricultural science and technology innovation and are deeply involved in modern agricultural development (Chen, 2010). The recent 10 years have witnessed increased input to agriculture in China, especially agricultural science and technology, and funding of projects in public agricultural research institutions has rapidly increased concurrently (Liu, 2009). With the constant changes in reform of national financial system, the central and local governments issued new financial reform measures and project fund supervision methods (Fu, 2009; Han et al., 2011) and the supervision of financial expenditure for agriculture is increasing. Faced with these new situations, problems, characteristics and requirements, there is need to improve and strengthen the management of agricultural research fund and ensure safe and highly efficient use of funds for the sustainable development of agricultural research.

How to manage and use research fund has become an important issue for provincial-level agricultural research institutions (Liu, 2012). Yu (2012) has analyzed the existing problems in funding of agricultural research institutions under the new trend. Luo (2011) discussed problems of horizontal scientific research fund in universities and measures for strengthening management. Wang (2012) has analyzed major problems and their causes of current research management fund and proposed some corrective measures. However, little is known of the characteristics of changes in management of project funds in provincial agricultural research institutions. Taking a provincial academy of agricultural sciences as an example, we analyzed the characteristics and existing problems in the sourcing and structure of project funds in recent years, summarized the experience in management of project funds and made appropriate recommendations.

2. New Characteristics of Project Fund

2.1 Rapid and Constant Growth in Total Amount of Fund

Since the implementation of the National Mid- and Long-term Plan for Science and Technology Development (2006–2020), the central and local governments have attached increasing importance to agricultural science and technology, constantly and rapidly increasing the research fund (Morck et al., 2008). Taking the Academy of Agricultural Sciences of province S and its 3 research institutions as an example, the average growth rate in

project funding has exceeded 50% since 2004. In some years, the growth rate was more than doubled. The total amount of project fund for the Academy of Agricultural Sciences of province S in 2013 increased 11 times compared with 2004, reaching 200 million Yuan; the total amount of project fund for A, B and C research institutes increased 12, 3 and 12 times in 2013 compared with 2004 (Figure 1). This indicates a rapid and unprecedented growth and fully reflects the close attention of central and local governments to agricultural sci-tech innovation.

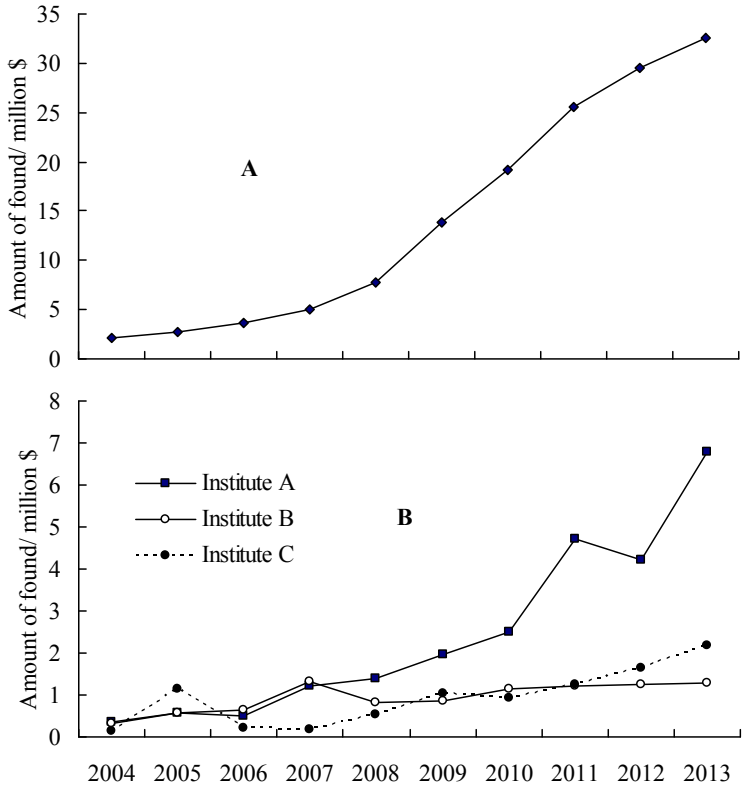

Figure 1. Changes in project funds in the academy of agricultural sciences of province S (A) and its three research institutions (B) in recent 10 years (1$=6.3 Yuan)

2.2 Significant Changes in Sources and Structure of Project Fund

Consistent with the rapid growth in scientific research funding, the sources and nature of fund have become to be diversified. Taking the Academy of Agricultural Sciences of province S as an example, there are three new changes in sources of project fund: (i) the fund for national level projects has assumed an increasingly larger portion. For the Academy of Agricultural Sciences of province S, this fund accounted for about 21% of total funds in 2004; it rose to 67% in 2013, indicating an ever closer attention of the provincial academy of agricultural sciences to national level projects; (ii) transverse funding has seen considerable growth. The ratio of transverse funding was 4% of the total funds in 2004; it rose to 16% in 2013 (54 times), indicating closer and closer attention of provincial-level academy of agricultural sciences to entrepreneurial cooperation with social forces and rural and social issues. The horizontal project fund has become an important source of scientific research fund; (iii) considerable growth in basic research project fund. The total amount of basic research fund, such as national natural science fund, 863 plan and 973 plan, was only 70 000 $ in 2004. By 2012, the amount reached 4.76 million $, being an increase of 57 times. The growth rate for basic research funding relative to total fund was 3.9% in 2004, increasing to 15% in 2012 and 16% in 2013, indicating closer attention of provincial agricultural research institutions to basic and applied research (Fig. 2).

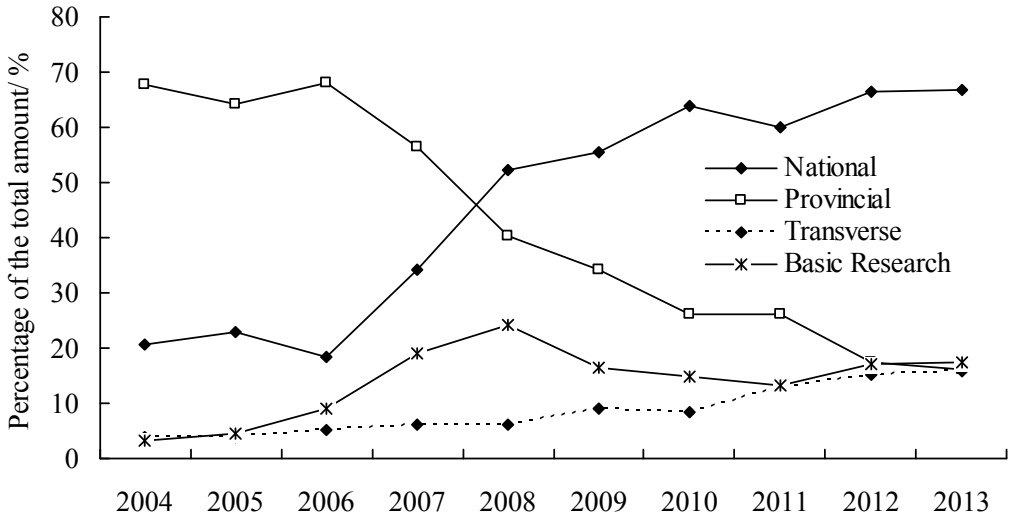

Figure 2. Changes in the percentage of each type of project funds in the academy of agricultural sciences of province S

2.3 Inconsistent Project Fund Management Method

Since the Eleventh Five-Year Plan period, central finance has formulated and revised a series of sci-tech special fund management methods. There were more than 20 rules, regulations and methods related to sci-tech fund management. Ministries and commissions also have corresponding fund management methods for different special funds, such as National Key Technology Research and Development Program, Special Project of Public Welfare Industry, Agro-industrial Technical System, Key Special Science and Technology Project, etc. However, different types and sources of scientific research projects or programs have different fund management systems and methods. There are no unified regulations on fund use, and the various fund management systems and methods are inconsistent and incompatible, making implementation very difficult (Li et al., 2011). For example, the Ministries of Finance and Science and Technology adjusted the scope of project funds for sci-tech support plan and special industrial fund in 2011. An indirect expense was authorized in accordance with excess regressive ratio method (less than 20% for up to 780, 000 $, 8% for up to 156, 000 $, and 5% for 1 to 780, 000 $). Since project types differ, it is impossible to determine the standard budget line. For another example, the expert consultancy fee is separately listed in some project management method, while it is included in the conference expense or labor cost in others, creating an enormous difficulty for management and accounting.

2.4 Varied Organizational Forms of Fund Use

2.4.1 Cooperation between Upstream and Downstream Institutions

Although only one institution undertakes (chairs) a research project, it allows cooperating units to undertake subprograms. Cooperative research and division of labor have become a new form of modern agricultural research (Guo, 2012). Therefore, the research fund should meet the requirements of the entire project and also be properly allocated according to research tasks of the subprograms to ensure smooth completion of tasks.

2.4.2 Cooperation of Horizontal Institutions

Research content and direction are relatively concentrated but also comprehensive. It involves every aspect and needs different disciplines to jointly solve key issues. Cross and horizontal organization is a new characteristic of modern agricultural research (Guo, 2012). Research in crop science for example may involve molecular breeding, genetics, crop cultivation and plant protection. It also involves agricultural machinery and economics, to jointly solve problems of different dimensions. Therefore, the demands of different disciplines for funds should be considered; neglecting any of these may hinder the smooth implementation of scientific research projects.

2.4.3 Personnel from Different Institutions Constitutes Joint Research Groups

Although a research project has only one coordinator, it allows sci-tech personnel from different departments and institutions to form research groups to tackle key scientific and technical problems. China is a vast territory and the distribution of scientific research resources is not uniform. There is great difference in scientific research

advantages and conditions among regions and departments, and there are changes in international supply and demand and national policy orientation; to integrate scientific research competence and tackle major projects, arrangement and use of scientific research funds should consider the differences and demands of different regions and departments (Guo, 2012).

3. Existing Problems of Project Fund Management

3.1 Disconnection between Fund Management and Project Management

At present, most agricultural research institutions have scientific research and financial departments to take charge of project management and fund management separately. The research department is responsible for application and establishment of projects, contract management as well as monitoring of projects and documentation of research findings, while the financial department is only responsible for allocation and accounting of scientific research funds (Han et al., 2011). The financial department focuses on whether the fund is used legally and whether expenditure conforms to national accounting system, but has no time to consider relevant provisions of project management and fund budget. The research department focuses on whether scientific research targets are realized on time and whether there is a novel achievement, but pays little attention to whether the fund use is consistent with budget. Weak management, willful action by each department regardless of overall interest and lack of communication and coordination are major reasons for disconnection between fund management and project management.

In addition, it is common for a project to be undertaken by several institutions, including project chairing institutions and cooperating institutions. In this case, the chairing institutions would allocate certain amounts of the funds to collaborating institutions based on contract or agreement. The project chairing institution is responsible for fund use and management, but since the financial departments of collaborating institutions are relatively independent, it is difficult for the chairing institution to allocate funds to collaborating institutions to manage.

3.2 Disconnection between Budget Preparation and Actual Demand

The disconnection between agricultural project budget preparation and actual demand reflects mainly in objective and subjective aspects. Objectively, agricultural research is highly influenced by environmental conditions, poor controllability, long cycle, few guidelines for preparation of research projects and many unforeseeable factors. Subjectively, the person responsible for the project is only responsible for progress of the scientific research and cares little about financial affairs; therefore, the preparation of research budget is relatively arbitrary, leading to big gaps between actual expenditure and the budget (Li et al., 2011). When preparing the budget, distinguishing between actual demand of institutions and incorporation of unnecessary expenditures create many passive factors for actual implementation, which are also essential reasons for the disconnection between budget preparation and actual demand (Chen, 2012; Tian, 2009).

3.3 Disconnection between Assets Management and Financial Supervision

Although there is a strict requirement for controlling equipment purchase in project application and it is encouraged to share, rent special instrument or upgrade existing equipment, the project coordinator is usually less inclined to the idea of using old equipment as long as new ones can be purchased. This not only wastes fund but also creates great difficulty for asset management, and easily leads to a disconnection between asset management with financial supervision. The following specific problems are common: (i) some institutions repeatedly purchase fixed assets. Some already have instruments and equipment. However, to complete project implementation and budget, they repeatedly purchase instruments and equipment. In some institutions, even different departments and project groups purchase the same instruments and equipment. As a result, some equipment are left idle and the assets utilization efficiency becomes relatively low; (ii) The assets management system is imperfect, leading to disorderly management. For example, some institutions do not promptly or never keep an inventory; no special person is charged with management; fixed assets are scrapped without regards to due process for state-owned assets. When purchasing large equipment, some institutions prefer buying small equipment, but do not list them in the inventory for management; (iii) there is problem of unlisted assets. Superior institutions and project chairing units allocate assets but not list them in their department; when some research projects are undertaken by the institutions themselves, they first purchase the equipment and then allocate to cooperating units for use. The invoice is registered in their financial departments, but the assets are owned by cooperating units, leading to hidden loss of assets (Liu, 2012).

3.4 Disconnection between Project Expenses and Actual Scientific Research

Since establishment of agricultural research projects is highly uncertain and the research spans a long period,

actual expenditure of funds is generally inconsistent with actual demand of the project (Fu, 2009). Management of the state over agricultural project fund is carried out in two ways: fund allocation and task management. Once a project is established, scientific research starts and some expense is also incurred. From project establishment to fund release, it takes at least two to three months, even half a year. Therefore, scientific research fails to start on schedule and may miss the optimum season for useful results. Such a situation exerts extremely adverse effect on agricultural research projects. When the funds eventually become available, they would have missed the optimum time for implementation, thereby disrupting actual research activities. To complete the cycle of fund expenditure, some projects rush into spending the research fund. This will lead to illegal accounting, weak financial control and loss and waste of funds. The cycle of fund expenditure is inconsistent with advances in scientific research tasks. This is an actual conflict. Agricultural research is completed in the field and laboratory, so the cost incurred is related to research platforms provided by the institutions, or related to service supplied by grass-root agricultural personnel. However, there is no express provision for these two aspects, making it difficult to submit such expense account.

4. Measures for Strengthening Project Fund Management

4.1 Establishing and Improving Financial Management System

Public agricultural research institutions should formulate perfect project fund management methods in accordance with provisions of Accounting Law of the People's Republic of China, Standardization of Basic Work of Accounting, Project Fund Management Methods, and Provincial Level Financial Regulations based on actual situations of the respective institutions. It is necessary to set subsidiary accounts for independent accounting project fund, do well in project fund management for research projects, avoid mix of special funds with other funds and avoid diversion and embezzlement of project fund from account source (Han et al., 2011). Scientific research fund and horizontal project fund (including sci-tech service income) should be incorporated into financial accounting, to strictly implement “two lines of revenue and expenditure” and manage funds in line with the principle of “unified accounting, classified management and project responsibility”. Besides, it is necessary to establish a scientific research project accounting system and undertake cost accounting based on details of budgeted items, to accurately, truthfully and comprehensively reflect actual expenditure of projects. There is also need to improve the project fund management process, increase comparison of the budget implementation, and include supervision into the whole process of project fund operation, to really ensure safe and effective use of funds. Also, there is need to build a communication platform for project and financial information to enhance knowledge of research personnel on fund use and project implementation, timely determine existing problems in project implementation, make correction and adjustment and facilitate project inspection and approval, as well as fund management.

4.2 Project Fund Budgeting and Financial Statement

Rational project fund budgeting relates to final implementation effect of the budget and determines whether the use of fund is accurate, scientific and reasonable. The budget making should: (i) Be consistent with actual demands of research projects (Li et al., 2011; Cai, 2012), (ii) Consider project research content and objectives as basis for ensuring consistency between budget and research objectives and support and guarantee the realization of research goals, (iii) Fully combine characteristics of research expenditure and consider the structure and amount of expenditure in recent years and (iv) Aim to strengthen the communication between scientific and technical personnel with the financial department to achieve a synergy of disciplines. Scientific and technical personnel should set project tasks and objectives from the perspective of professional requirements and make basic budget for the project. The financial department provides informed guidelines from the perspective of financial affairs. During the project period, it is recommended to have a special person responsible for project fund and monitoring to relieve the research personnel from financial affairs and better focus on agricultural research (Wang, 2012).

4.3 Establishing a Fund Management System for Agricultural Research Projects

Establishing fund management system and regulations as well as strengthening supervision and management are the basic guarantee for safe and effective use of project funds (Zhang, 2012; Shui, 2011). This will involve: (i) establishing regular inspection and auditing system for the fund. During execution of research projects, it is necessary to submit an annual report on expenditure of project fund to the financial department and undergo financial inspection. The audit department should undertake sample auditing of use of project funds (Luo, 2011; Huang, 2011). After completion of research projects, there should be a dual auditing system to find problems, block loopholes, improve internal control and take appropriate remedial measures in case of any problem; (ii) Establishing a system of specific fund for specific purpose. It is necessary to formulate reasonably paid

utilization management method for project funds, reduce arbitrary and unreasonable use, ensure specific fund for specific purpose and avoid loss of funds; (iii) Establishing and improving fund reporting system. For cooperative research, it is recommended to improve fund reporting system, reduce transfer of scientific research fund level by level and ensure safe use of funds; (iv) Establishing a coordination mechanism for project management and fund management. In view of the inconsistency between fund allocation and execution of projects, there is need for project establishment to be consistent with international practice, avoid delay of project work and establish a coordination mechanism for independent project establishment, fund allocation and project management. There is also need to strengthen implementation and specify research contract to eliminate the worry of research personnel (Cai, 2012). (v) Establishing unused fund management system and scientific performance evaluation system (Huang, 2011). For different projects, the provisions are different for management of unused fund. It is recommended to establish a proper mechanism and evaluation system suitable for research fund management in accordance with actual situation.

Given the many detailed problems in the implementation of a budget, it is necessary to fully consider the difficulty of labor employment in agricultural research projects and undertake strict examination and flexible grasp (Zhang, 2012). For example, the research institute C has laid down specific regulations on labor costs for postgraduates and seasonal labor employment. Recruitment of postgraduates and employment of temporary workers should be approved and implemented in accordance with relatively uniform subsidy and labor standards. For college students, the allowance for living expenses should not exceed 6 $/day; for master students, the allowance is 100–166 $/month; for doctoral students, it is 130–250 $/month. The specific allowance may be adjusted in accordance with actual work load; for temporary workers, the reference standard is 9–10 $/day. If the project has special provision, it should be implemented. Besides, it is required to undertake strict reimbursement process: firstly, the attendance monitor fills in the bill of payment, submits it to a responsible person in the department or the project chairman for approval and then the cashier' office grants the bill through bank card or the applicant personally goes to receive the payment. For temporary worker employment, the scientific and technical personnel responsible for research should appoint at most three persons to undertake group management, and the payment should be settled by a designated person but the person receiving payment should provide a signature. Generally, the labor cost is paid through bank transfer but the worker should provide a personal identification card number.

4.4 Strengthening Asset Management and Clarifying Asset Ownership

Firstly, make clear ownership and classified assets management. Since ownership of scientific research findings is unique, it is necessary to arrange a special management department and formulate an appropriate management system for such assets (Wang, 2012). Assets purchased by public institutes using project funds are classified as state-owned assets and their use and management rights are held by the entity undertaking the project. Therefore, it is necessary to include assets account of the institute for accounting and classified management. If allocation is required between research institutions, the allocation process should be handled in accordance with relevant provisions for transferring management rights and prevent loss of state-owned assets. Secondly, there is need to establish and improve assets management system. Detailed management of assets should be strengthened and their overall use should be made. Besides, it is necessary to explore the establishment of resource sharing platforms, formulate a standard for rational expenses, strengthen overall management of state-owned assets, promote reasonable allocation of assets, increase assets utilization efficiency and partially solve the problem of funds. Thirdly, the management of government purchases should be reinforced. It is necessary to actively explore supervision process for the purchase of large instruments and equipment, make overall arrangement for government purchase plan and considers instrument and equipment replacement methods (Shui, 2011).

5. Conclusions

With the increasing attention of both the state and local government to agricultural science and technology, the funding of provincial agricultural research institutions has witnessed a rapid growth in total amount, significant changes in sources and structure of project fund, varied fund management methods and diversified project organization. However, there are problems of disconnection between fund management and project management, budget preparation and actual demand, asset management and financial supervision and project expenditure and research realities. Given these new situations and problems, it is necessary to set up idea of “overall financial affairs –All including researchers should be involved in financial management” (Huang, 2011; Hunag and Peng, 2011), build project management system by means of budget control through improved management, development and sharing of scientific research platform and innovation awareness. There is also need to improve and strengthen the management of project funds, ensure safe and highly effective use of fund and improve the overall scope of agricultural science and technology innovation.

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