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Research on the Problems and Countermeasures of Raising Funds for Popular Science in Ethnic Areas

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Abstract: *For the modern economy, the contribution of improving human knowledge and ability to economic growth is far more significant than that of increasing material capital and labor. Given China's national conditions, the popularization of science in ethnic areas is of great significance. The focus is fund-raising to ensure science popularization's continuous and practical implementation in ethnic regions. Therefore, this paper takes the aerospace education base, one of the largest popular science education bases in Sichuan ethnic areas, as an example, sorts out fund-raising problems, and puts forward corresponding effective management methods. The continued operation of regional science popularization plays an important role.*

Keywords: *Popular science funds; Raise and management; Continuous operation*

1. Introduction

General Secretary Xi said, "Scientific and technological innovation and dissemination of science are the two wings to propel our innovation-driven development. The latter should be considered as important as the former. " In the new situation and period, the state has put forward new requirements for popular science work in ethnic minority areas. In this paper, we conduct research in Sichuan. Sichuan is a multi-ethnic settlement with 55 ethnic minorities and nearly 5 million people. Next, it is the largest settlement of Yi people and the second-largest Tibetan area in the country. Moreover, it is the only Qiang nationality settlement in the country. At the same time, as one of the representatives of Sichuan ethnic areas, the Aerospace Model Science Education Base (hereinafter referred to as the base) has carried out more than 100 popular science activities in the ethnic regions over the past six years. However, it is often constrained by the shortage of funds, which affects the continuity and effectiveness of popular science in ethnic areas [1].

This paper studies the fund-raising and management methods of the base, analyze the causes of the shortage of funds in the base and the difficulty in capital turnover and provide a reference for ethnic areas. Other regions can also achieve open source and reduce the expenditure of funds, ensuring that the source of funds is diversified and sufficient and the management is efficient and orderly. Therefore, to promote the continuous development of popular science activities in ethnic areas, thus gradually improving the quality of popular science.

Funding is a crucial factor affecting the quality of popular science. By improving the financial situation, the science popularization work of the base can be carried out smoothly. On the one hand, to popularize science and technology in Sichuan so that farmers and children can receive advanced scientific and technological knowledge. Let them learn, understand, love, and use science. Integrate popular science activities into public life, promote the formation of a fashion of advocating science, boost the overall improvement of the scientific quality, and lay the foundation for the talent pool for rural development.

On the other hand, carrying out popular science activities is of great significance for developing agricultural science and technology in ethnic areas and even improving rural productivity. In addition, the development of science and technology drives economic growth [2].

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2. General Situation and Analysis of Fund Raising, Use and Analysis of Aviation and Aerospace Model Popularization Education Base in Sichuan Ethnic Area

2.1 Description of the Current Situation of Fund Raising and Use of Aerospace Model Science Popularization Education Base in Sichuan Ethnic Areas

(1) Funding sources: Until June 2022, a total of 1.036 million yuan has been spent on popular science activities in five years. The details are shown in Table 1:

Table 1: Detailed Statement of Capital Sources

Topic	Funding Office	Time	Amount (unit: ten thousand yuan)
Cultivation and practice of innovation consciousness and innovation ability of primary and middle school students in the County	Sichuan Provincial Department of Science and Technology	2018	30
Information integration processing platform based on multifunctional unmanned service system	Sichuan Provincial Department of Science and Technology	2018	22
The dissemination, innovation, and practice of aerospace science and technology knowledge in primary and secondary schools in Hongyuan County	Sichuan Provincial Department of Science and Technology	2019	20
Demonstrative construction of popular science practice base in primary and secondary schools in Hongyuan County	Ministry of Finance	2020	10
Research on the demonstration and application of intelligent technology in ethnic areas under the rural revitalization strategy	Ministry of Finance	2021	15
Modern technologies such as drones help rural revitalization	Ministry of Finance	2022	5
The construction project of the base of aerospace model popularization education in the Sichuan minority area	Sichuan Provincial Department of Science and Technology	2022	1
Special funds for popular science in ethnic areas	Southwest University for Nationalities	2022	0.6

The above data shows that the funds mainly come from the primary scientific research business fees of central universities issued by the Ministry of Finance. The funds were obtained from the projects declared by the Science and Technology Department [3].

(2) Use of funds: During the five years of popular science activities, the use of funds is mainly in consumables, equipment, travel expenses, etc. The distribution is shown in Figure 1.

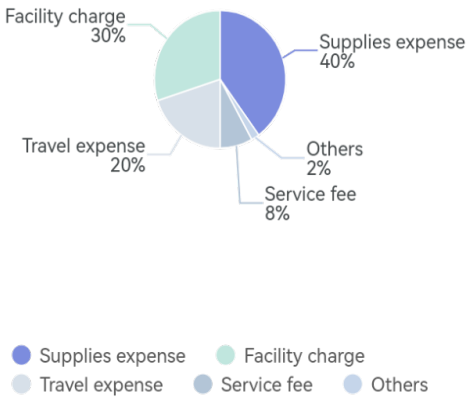

Figure 1: Detailed statement of fund use

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The equipment and consumable fees of the base are mainly used on base infrastructure, and the travel and labor costs are used primarily in the science popularization.

(3) Scope of popular science: Since its establishment, the base has covered more than 40 counties and cities in six provinces, including Qinghai, Sichuan, Hunan, Chongqing, and Tibet, and more than 100 primary and secondary schools, with more than 58,000 beneficiaries. The base organically combines science support with technology to help agriculture, independently builds a systematic and scientific training system, develops characteristic science courses, from theory to practice, from middle-aged to young people, and completes the three-dimensional construction of science content. The activity has achieved good results, benefiting more than 40 counties and cities and more than 100 schools. Given the influence of the base in ethnic areas, the school has set up special funds, which are supported by a fixed special grant every year. Moreover, it also improved the success rate of the base's application for projects in the Science and Technology Department of Sichuan Province, thus obtaining an average annual special fund of 150,000 yuan [4].

2.2 Analysis of Current Situation of Aeronautics and Astronautics Model Science Popularization Education Base in Sichuan Minority Areas

It can be seen from the data collected above that all funds come from government financial allocation, which has apparent singularity and limitation. Because of the severe shortage of funds, the expenditure proportion of the base is also unreasonable in the three main parts of the cost structure, and the ratio of the three parts is not coordinated. Then, to achieve science popularization in the minority areas, we must increase the investment in corresponding facilities and travel expenses. In summary, the funds of a representative provincial science popularization base are insufficient. The science popularization base in other ethnic areas is not optimistic, either.

3. Current Situation of Fund Raising and Utilization of Science Popularization Education Bases in Minority Areas

3.1 Poor Stability of Capital Sources and the Investment in Science Popularization is Challenging to Guarantee

From a microscopic point of view, according to the statistics of the base's funding sources from 2018 to 2022, the sources are the project funding of the Sichuan Provincial Department of Science and Technology and the basic scientific research business expenses of central universities [5]. And the annual expenditure fluctuates because the base does not have continuous and stable funding from the government, and the proportion of the financing for declared projects has reached 70%. However, the success of the application of the project is contingent. Once the application fails, it will risk a shortage of funds and stagnation of popular science activities. As a result, the risk coefficient of the fund operation of the project is high, and the amount of funds invested is difficult to guarantee the sustainable development of popular science.

3.2 The Source of Funds is Single, Mainly Relying on Government Subsidies

From the macro perspective, there is still a significant gap between China's investment and practical demand for science popularization. It influences and restricts the sustainable development of science popularization. US President Biden's 2022 fiscal year federal budget proposal submitted to Congress shows that the budget for US national basic research, applied research, and advanced technology development portfolio (collectively referred to as science and technology projects) is 14.7 billion dollars. The STEM (Science, Technology, Engineering, and Teaching) defense education program amounted to $112 million. In 2022, the Ministry of Science and Technology of China and the fiscal appropriation budget will be 47 billion yuan, of which only 13 million will be used to popularize science and technology. The number of provincial science popularization bases in Sichuan Province has reached 208. After allocating, the funds available to grassroots science and technology organizations are minimal. Taking this base as an example, building base facilities and organizing popular science activities require a lot of financial support, leading to a shortage of resources.

According to the statistics of the base's funding sources from 2018 to 2022, government funding is almost the only source of income. This phenomenon is widespread in China. Compared with China and foreign countries, we can see that the origins of funds for science popularization in different countries

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have different characteristics. On the whole, there are mainly two channels: government appropriation and social collection.

In developed countries, the sources of funds for science popularization are more diversified, such as social donations. But government funding is limited. However, the funds for science popularization activities in China mainly rely on appropriation from the government to ensure continuous operation, and the source is relatively single. In 2020, the scale of national science popularization work funds raised was 17.172 billion yuan, and government investment was the primary source, generally accounting for more than 60%, even as high as 80.59%. The single source of funds undoubtedly reflects the lack of self-revenue of the base, and there is no fund collection and absorption for the public, which is not conducive to the long-term operation and development of the foundation.

3.3 The Coordination Mechanism Needs to be Improved, and the Funds are Low-quality and Inefficient

With the rapid development of China's economy and the continuous improvement of national quality, the government has been paying more attention to popular science, especially in rural areas. The scale of fiscal appropriation has continued to expand, and the problems of weak links have become increasingly prominent. China's social forces on science popularization have not been fully launched, and the relevant organization system and coordination mechanism have not been perfected [6]. The low-level and repetitive investment of relevant departments is prominent, and social resources have not been circulated and shared. These lead to high costs and low quality of popular science activities, and the public's sense of acquisition and acceptance is relatively low.

Through long-term practice in the base, it is found that due to the non-communication of information resources, it is difficult to match the supply and demand. On the one hand, the educational resources in the southwestern region are lacking. Some people in need cannot obtain appropriate resources for popular science. On the other hand, charitable and voluntary resources from enterprises, universities, and social organizations cannot launch projects, and existing resources are largely redundant. In addition, due to the lack of standards, platforms, and mechanisms, the misallocation or inefficiency of charitable resources is very prominent, resulting in the waste of many funds.

4. Countermeasures and Suggestions

4.1 Focus on Education to Expand Influence and Strive for More Financial Allocation

The essential means for the country to rejuvenate through science and education are expanding the popularization of science and technology and improving citizens' scientific and cultural quality. Given the lack of investment in science popularization, it is necessary to increase the popularity and influence of the base to obtain a tilt of government resources to benefit the public better.

In the future, we should continue developing the courses. We had better create exciting and popular curriculums for children and farmers. Through this, children can understand it, and farmers can learn to use it so that popular science can benefit the countryside rather than fancy teaching or unilaterally forced indoctrination. At the same time, make full use of the unique advantages of ethnic colleges and universities in serving ethnic areas, as well as the strong cohesion of the tripartite linkage between government, school, and enterprise, to promote the in-depth extension of science work. In addition, we actively summarize the results of the activities so that the educational work can be quantified and visualized to win over more policy funding to support.

4.2 Unified Deployment of Bridge Resources to Improve Resource Matching Efficiency

We signed a long-term strategic cooperation agreement with the government of Gan'aliang, three prefectures, through Sichuan Aerospace Base. With the help of the school's social practice activities, it has joined forces with four high-tech enterprises and six professional organizations, including China Association for Science and Technology, Aba Prefecture UAV Association, Firefly Public Welfare, Yiwei Youth, the Social Development Foundation as well as other six public welfare organization. We are condensing the synergy of multiple parties, continuously guaranteeing the launching of popular science activities. According to the unified strategic deployment, the efficiency of resource allocation can be improved, the repeated investment of resources can be reduced, and the quality and effect of popular science can be improved. In the future, ethnic areas should learn from the experience of the base, make

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good use of all favorable conditions, bridge the unified deployment of resources, and improve the efficiency of resource matching.

4.3 Trace the Whole Process of Capital Receipts and Payments, Improve Systems and Standardize management

Improve the management before, during, and after the event. Achieve source and reduce expenditure to improve the utilization rate of funds.

First, to strengthen the prior capital budget. Do market research in advance and thoroughly compare multiple suppliers before purchasing materials to ensure quality, reduce the purchase price, and establish stable cooperative relations with enterprises with excellent reputations to obtain preferential prices.

Second, to strengthen real-time control. The managers pay attention to the tracking and supervision of the project implementation and the fund use, collect relevant information, correct unreasonable fund use on time, and adjust management methods in real time according to the project's progress.

Third, pay attention to the assessment and evaluation after the event. After each activity, summarize and analyze the data recorded in the process of science popularization, the degree of achievement of performance goals and evaluate whether the project implementation process and capital expenditure progress are following the expected plan. At the same time, the problems existing in the implementation are fed back, analyzed, and discussed. The solutions are proposed, and issues are solved in practice to make the system more modern and scientific.

In addition, they implement internal and external supervision. Improve the internal audit mechanism, strengthen the audit of reimbursement invoices, and avoid random reporting, misstatement, and re-statement. Popular science is related to the scientific literacy of all citizens and therefore requires the joint supervision of the whole society. Next, focus on building a charitable organization's activity information supervision scenario and explore establishing an intelligent feedback mechanism for charitable donations to be queried and traceable. Then, openly and transparently give feedback on the inflow and outflow of each fund so that the donors and the recipients can use it without worries.

To sum up, to achieve the sustainable development of public welfare projects, we need to control the source and the use of funds. It is necessary to expand the financing channels from the original and pay attention to management and control to realize the long-term operation of popular science activities in ethnic areas.

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