

## Analysis on Science Popularization Mode in Ethnic Villages: A Case Study on Youshuihe Town in Youyang Tujia and Hmong Autonomous County

WANG Lijuan<sup>[a],\*</sup>

<sup>[a]</sup>The Research Institute for Education and Psychology of South-Western Ethnic Group Southwest University, Chongqing; Ankang University, Ankang, China.

\*Corresponding author.

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### Abstract

During popularization of science in ethnic villages, new science popularization modes unique to minorities should be explored considering the prominent problem that the existing science popularization mode, restricted by such factors as ethnic groups, diverse cultures and territorial environments, has become incapable of adapting to and satisfying local demands for science popularization. Based on a case study on science popularization in Youshuihe Town, Chongqing, a new mode, which gears to the multicultural society, centers upon ethnic villages and villagers' pursuit for science popularization, integrates various useful resources from the perspectives of personnel, content selection, management mechanism, ethnic culture and natural environment, and aims at improving the scientific quality of ethnic villages and villagers, will be investigated into in this paper.

**Key words:** Southwestern China; Minority; Village; Science popularization; Mode

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### INTRODUCTION

Law of the People's Republic of China on Popularization of Science (hereinafter referred to as the Law of

Popularization of Science) was promulgated in June 2002, Articles 4 and 20 of which respectively read: "The State supports efforts for science popularization made by people in minority areas and in outlying poverty-stricken areas"; and "the State strengthens work for science popularization in rural areas". The Outline for National Scientific Quality Invigoration Program (2006-2010-2020) (hereinafter referred to as the Outline)<sup>1</sup> promulgated in 2006 explicitly proposed the tasks and measures for "farmers' scientific quality invigoration", which not only provides legal and policy guarantee for the State's popularization of science in rural areas, but also indicates the importance of science popularization in rural areas. China is a country with vast territory and dense population, and the minority population is distributed in relatively fixed regions in terms of geographical location. With reference to the geographical location, natural climate, ethnic habitation and other elements in the living areas, Mr. Fei Xiaotong divided the whole territory resided by the Chinese people into eight historical ethnic regions, including Grassland Region in Northern China, Alpine and Forested Region in the Northeastern Corner of China, Qinghai-Tibet Plateau in Southwestern Corner of China, Tibetan-Yi Corridor, Yunnan-Guizhou Plateau, Nanling Corridor, Coastal Region and Central Plains Region. (Fei, 1983) In view that there are significant gaps between different minority areas in the aspects of population distribution, ethnic culture, living customs, economic development level, and physiographic condition, the science popularization work in each rural area also differs, presenting a diversified development trend. Located in Southwestern China, bordering Sichuan Basin, Yunnan-Guizhou Plateau and Qinghai-Tibet Plateau, and covering an area of 21.17467 square kilometers which accounts for 22.1% of total area of China, the Minority Area of Southwestern China (including such minority areas as Tibet Autonomous

<sup>1</sup> State Council. (2006, March 21). Outline for National Scientific Quality Invigoration Program (2006-2010-2020).

Region, Guizhou Province, Yunnan Province, Liangshan Yi Autonomous Prefecture, Garze Tibetan Autonomous Prefecture, Ngawa Prefecture and Qianjiang in Chongqing), for example, is one of the leading habitats for minorities inhabited by 51 minorities of China (Wang, 2007).

Influenced by physiographic conditions, local economic development, historical development, ethnic culture and many other factors, the minority population in the Minority Area of Southwestern China is mainly concentrated in villages, thus bringing about obvious differences in science popularization of ethnic villages in this area from that of ethnic villages in other areas. Currently, the Science Popularization Mode led by the State and promoted in the rural areas cannot effectively adapt to and meet the personalized and diversified needs for science popularization in different ethnic villages. Thus it needs to be reflected and reformed.

This paper takes the science popularization work in Youshuihe Town inhabited by generations of Tujia people in Chongqing as an example to analyze problems and shortcomings of existing science popularization mode<sup>2</sup> in minority areas, and attempts to establish a science popularization mode that suits minority areas based on the ethnic villages' and villagers' pursuit for science popularization.

## 1. EXISTING SCIENCE POPULARIZATION MODE IN TUJIA VILLAGE, YOSHUIHE TOWN

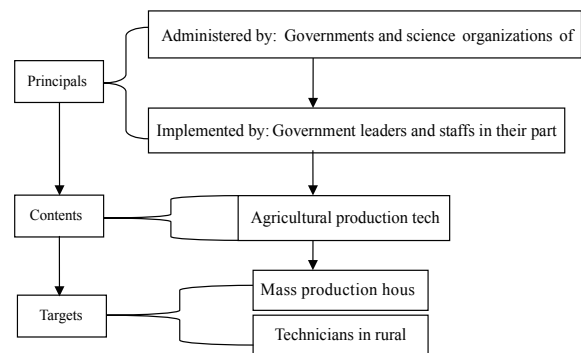
Located at the intersection of Chongqing, Hubei, Hunan and Guizhou, Youshuihe (formerly known as Houxi) Town, Youyang County is a town administered by Youyang County, Chongqing. Situated at Wuling Mountainous Area, it boasts an upland rice farming culture. Constituting the major part of the local residents, Tujia people account for more than 80% of the total population in this area, which is different from villages inhabited by Han people or by multiple ethnic groups in that it preserves Tujia original culture and forms its own distinct regional ethnic characteristics<sup>3</sup>.

In recent years, rapid development and great

<sup>2</sup> There is not any authoritative academic explanation to "science popularization mode" in the academic community of China. By analyzing the facts and existing research results related to science popularization in China, the paper attempts to explain this basic concept so as to lay foundation for subsequent researches. The so-called "science popularization mode" refers to a repeatable and relatively stable mode in which the principals in charge of science popularization, based on relevant laws and policies and relying on existing science popularizing mechanism, select some natural science and social science based knowledge, and scientific technologies and thoughts for dissemination among the targets in ways that are apt to understand, accept and participate in.

<sup>3</sup> The materials and data, sources of which are not quoted in the paper, are obtained by numerous field investigations by the author.

achievements have been made for science popularization in Youshuihe Town, a grass-root village settled by Tujia people, with tremendous support from the State and Chongqing Municipal Government. Since 2007, Youshuihe Town Government has continuously carried out the following activities to promote science popularization work in all the villages: Establishing permanent science popularization consulting and serving organizations in villages and town; creating popular science demonstration bases in rural areas and comprehensive information service platform in new rural areas; developing pilot town for science popularization in Chongqing; participating in Science & Technology Week and Spring of Science & Technology held in Youyang County; implementing Blessing Project and Plan of Benefiting Rural Areas and Rejuvenating Villages through Science Popularization; and holding Science Popularization Activities in Villages and Sending Scientific Special Commissioner into Villages.<sup>4</sup> Currently, the science popularization pattern of this town (Figure 1) has developed into a representative model for science popularization of ethnic villages in southwestern China and become a model for other ethnic villages to imitate during science popularization.



**Figure 1**  
Existing Science Popularization Mode of Youshuihe Town

## 2. ANALYSIS ON EXISTING SCIENCE POPULARIZATION MODE IN ETHNIC VILLAGES

Science popularization work in Youshuihe Town is administered and supported by government entities at all levels in the aspects ranging from content, organization, management, personnel, capital source to specific implementation. The administrative power led by the local government constitutes the foundation and guarantee for smooth progress of science popularization work in this very village.

<sup>4</sup> Refer to texts related to Science Popularization Summary of Youshuihe Town Government of Youyang County provided by Youshuihe Town Government in the recent five years from 2009 to 2013.

## 2.1 The Characteristics of Existing Science Popularization Mode

### 2.1.1 Top-Down Single-Track Operation Mode

Every science popularization work is comprised of principal, intermediary and target. Among them, the principals and targets are objective, concrete and constituted by real people, while the intermediary is the summation of all elements including goal, content, method, approach and resource that link the principal and the target in an organic manner. All of these three factors are interactive and inter-restricted. It can be seen from this analysis on components of existing science popularization mode in Youshuihe Town and their relationship that the principals are constituted by those in charge of science popularization administration and implementation, both of which are at the top of the mode, while the targets are ethnic villages and villagers, which are at the bottom of the mode. Demonstrated in the whole science popularization process is top-down, inside-out single-track communication and management from the principals to the targets. In addition, the principals play a direct role in deciding goal setting, content selection, organization planning, fund support and the relationship between sciences personnel at all levels.

### 2.1.2 Government and Administrative Personnel as the Main Members

It can be learned from Figure 1 that the principals in Youshuihe Town, whether in charge of administration or implementation, are mainly made up of county government, town government as well as the departments and workers under their jurisdiction. The officials of the county and town governments assume direct responsibility for science popularization in rural areas by acting as part-time members of the leadership team for grass-root popularization of science. The chief of Youshuihe Town, for instance, is the head of such team, and all the workers from each department of the county and town governments are part-time workers for science popularization in rural areas. The county and town governments hold full responsibility for the science popularizing activities regularly held in the town.<sup>5</sup>

### 2.1.3 Contents Focused on Agricultural Technologies

Youshuihe Town is located in Wuling Mountainous Area at southeast of Chongqing with its dominant production method as upland rice farming. In consequence, great importance is attached to agricultural technology promotion in each link from target presetting to actual organizational management during science popularization with the content organization focused on selection of agricultural technology. For example, agricultural science popularization demonstration bases and science popularization technology platforms are established,

<sup>5</sup> The materials and data, sources of which are not quoted in the paper, are obtained by field investigations by the author.

full-time agricultural technician posts are provided in villages, and spreading and popularizing of agricultural technology knowledge among villages and villagers are paid attention.<sup>6</sup>

## 2.2 Problems in Existing Science Popularization Mode

The requirements and goals of improving the scientific quality and living quality of villagers in minority villages, to some extent, have been realized during science popularization of Youhsuihe Town, a village with advanced science and concept popularization in ethnic villages of southwestern China. On the other hand, the prominent shortcomings and problems in this mode also reduce the actual effect for science popularization. The problems and shortcomings as described as follows.

### 2.2.1 Narrow Staff Composition

In this mode, the local administrative power dominates the whole process of science population in rural areas, and the principals and targets are composed of local government officials, ordinary executive staffs, a few technicians in rural areas and few farmers. Deprived of dominant role in science popularization, the rural areas and the ordinary farmers are at the bottom of the whole structure and in a passive position to accept, which results in ignorance of villagers' and villagers' realistic requirement for science popularization. Meanwhile, other social organizations and professionals are also excluded from the range for member composition.

### 2.2.2 Unreasonable Content Setting

a) There is a lack of advanced scientific ideology, scientific spirit and common sense. By analyzing the specific contents of science popularization carried out between 2007 and 2014 in Youshuihe Town<sup>7</sup>, it reveals that all the science popularization activities in this town lay particular stress on spreading of agricultural technology<sup>8</sup> while neglecting scientific thought, scientific spirit and common sense of life. Such kind of content setting is unfavorable not only for improvement of farmers'

<sup>6</sup> Summary of Youyang County Science & Technology Week from 2009 to 2013 provided by Sci-tech Work Leadership Team Office, Youyang County.

<sup>7</sup> Refer to Summary of Youyang County Science & Technology Week from 2009 to 2013, and the author's field investigation materials and interview records in 7 administrative villages subordinate to Youshuihe Town.

<sup>8</sup> It can be concluded from the statistics of several field investigations that since 2007, Youshuihe Town Government has attached great importance to pass on advanced agricultural technologies to farmers in this town by creating popular science demonstration bases and comprehensive information service platforms, and implementing blessing project, plan of benefiting rural areas and rejuvenating villages through science popularization, popularizing science in villages and sending scientific special commissioner into villages. Now planting bases for fruits, green prickly ash, *Castanea mollissima*, *Radix puerariae* and *Artemisia apiacea* have been completed, but in terms of contents for all science popularization activities, there is a lack of advanced scientific thought and scientific spirit.

scientific quality, but also for enhancement of general living quality of the rural society and the farmers.

b) There is a lack of local knowledge. For farmers, local knowledge is the summary of daily life experience, and the wisdom of life which they are familiar with and easy to understand. They should, therefore, be included in the contents of science popularization. However, the contents for years of science popularization work in Youshuihe Town only involve introduced agricultural technology knowledge with local knowledge excluded, and its specific cultural effect and value in science popularization of ethnic villages are overlooked, aggravating the elapse of technical knowledge of local ethnics. For example, Youshuihe Town, which is located within the upland rice farming culture area, enjoys long inherited skills for mountain rice farming and fish farming in the fields, but now they are in danger of extinction. For one thing, this is because most local labors go out for work. For another, such local knowledge is not chosen as the content for science popularization in villages, leading to that the stay-at-home villagers can only receive introduced technical knowledge with which they are unfamiliar. Such local knowledge also disappears along with the passing away of skilled aged men in the village.

c) There is a lack of scientific knowledge related to ethnic traditions. Many minorities in our country have long histories, and in their ethnic culture systems, there are a lot of precious scientific knowledge or ideas which should be adopted as options for contents of science popularization in ethnic villages. Such knowledge, however, is not incorporated in the selected contents of existing science popularization. In the activities carried out to disseminate rural health care and disease prevention in Youshuihe Town, for example, only modern medical care knowledge is involved without mentioning any traditional disease prevention methods of Tujia people, or converting modern medical knowledge into expression comprehensible to local people. As a result, they fail to understand, or show no interest.

### **2.2.3 Unawareness of Influence From Multi-Cultural Difference**

In this mode, applying science popularization in ethnic villages by thought pattern of Han people without any consideration given to the cultural differences between Han people and Tujia people significantly lowers the effect and quality of science popularization. In previous science polarization activities of Youshuihe Town, plenty of bulletins, posters, banners and many other publicity materials would be made in Chinese characters. Further investigations reveal that a majority of Tujia people are poor at using Chinese. Generally, they can make oral communication, read or write in simple Chinese. What is worse, some aged villagers are illiterate about Chinese, and they cannot grasp what is conveyed by the publicity materials at all. This is as if, in their own words, listening

mumbo-jumbo or reading sealed books.<sup>9</sup> Furthermore, with development of economy and increase of social mobility, the young and middle-aged who have certain knowledge of China have left their hometown to seek for a job, while the aged Tujia people left behind can only use Chinese for daily communication. In some remote rural areas, the aged still communicate in Tujia language. When science was popularized in rural areas, the enthusiasm of the principals was unfortunately responded with ignorance of the targets for short of effective communication between them.

### **2.2.4 Lack of Full-Time Grass-Root Personnel**

Although Youshuihe Town has laid emphasis on science popularization and almost all of the officials and civil servants from the town government have assumed the post of science popularizer in this village, they show limited care to science popularization in reality due to their devotion to daily government affairs. The full-time grass-root science popularizers are far and between. This town administrates 7 villages with a total population of 20,000 and an area of 124 square kilometers,<sup>10</sup> but by the end of 2013, there are only three full-time technicians. Thus it is of no possible to improve the quality of science popularization in villages.

### **2.2.5 Lack of Financial Support**

All expenses for science popularizing in ethnic villages, including payment for workers and expenditure for all activities are wholly dependent on financial allocation of the State, which fails to meet the expenditure requirement for science popularization in grass-root villages. For example, the problems resulted from shortage of expenditure include: outdated facilities; incomplete network for education and communication; failure in displaying the demonstration effect of achieving “blessing” and “wealth” by science popularization; limited paths for farmers to acquire scientific knowledge, which is unable to meet the actual needs.

### **2.2.6 Lack of Scientific Assessment and Feedback**

In this mode, there are only links of plan and execution instead of checking and feedback, indicating that there lacks in necessary assessment and feedback mechanism for science popularization. In other words, science popularization work cannot be effectively supervised and managed, resulting in lack of necessary interaction between the principals and the targets, failure to get timely feedback over effects of science popularization activities, and incapability to correct the defects, which is not conducive to healthy development of science popularization in ethnic villages.

<sup>9</sup> The sources are dictation data and interview records of villages in Youshuihe Town and its 7 subordinate villages.

<sup>10</sup> Chongqing Youshuihe Town Committee. (2012, February). Youyang County Introduction.



### 3. NEW MODE FOR SCIENCE POPULARIZATION IN ETHNIC VILLAGES OF SOUTHWESTERN CHINA

#### 3.1 Dual Tasks for Science Popularization in Ethnic Villages of Southwestern China

The progress and development of rural areas in China are not only embodied in the respects of social environment, medical care, education and individuals' living quality, but also in improvement of individuals' scientific thought and scientific quality.

In terms of ethnic villages in Southwestern China, the science popularization activities are allocated with tasks to improve the living quality and scientific quality of villagers, and to promote communication and exchange between multiple cultures. On the one hand, "Program Oriented to Improve Farmers' Scientific Quality", a science popularization activity implemented by China in rural areas, is a critical path to improve individuals' living quality and scientific quality in Southwestern China. On the other hand, influenced by objective differences related to region, race, religion and culture, the local minorities' recognition on and expectation for science popularization differ from those of minorities in other regions. The science popularization in ethnic villages at Southwestern China should not only propagate and popularize advanced knowledge, technologies, thoughts and concepts, but also function as a bridge to enhance communication and exchange between different cultures with full considerations given to regional culture and ethnic culture.

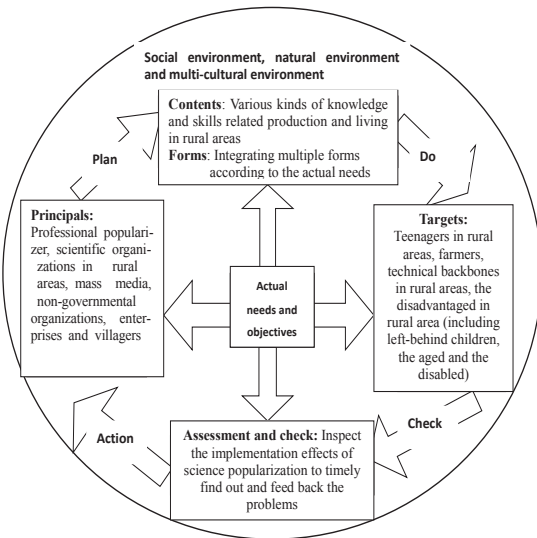
#### 3.2 New science popularization Mode in Rural Areas of Southwestern China

With reference to the Deming Circle (PDCA Circle)<sup>11</sup> theory, this paper constructs a new mode for science popularization in ethnic villages of Southwestern China (Figure 2) from the perspectives of science popularization process, relationship between the principals and the targets, the contents, the actual needs and the multi-cultural social and natural environments.

#### 3.3 Feature of New Mode for Science Popularization in Ethnic Villages of Southwestern China

The feature of new science popularization mode in rural areas of Minority Area of Southwestern China will be elaborated on in the following paragraphs

from such elements as principal, target, content, working mechanism and management model of science popularization.



**Figure 2**  
**New Mode for Science Popularization in Ethnic Villages of Southwestern China**

#### 3.3.1 Diversified and Multi-Level Staff Network

The mode with administrative bodies and their members as the principals must be abandoned with a view to enriching the compositions of principals, actively absorbing various kinds of people to engage in science popularization in minority areas, establishing a staff network led by the government and jointly participated in by scientific organizations, mass media, enterprises, non-governmental organizations, villages and farmers, and integrating potential science popularizers, such as village head, singer and pharmacist from ethnic villages into the staff network.

#### 3.3.2 Focus of Work on Goals and Villagers' Practical Needs

First, the basic goal that the State tries to improve individuals' scientific concept and quality via popularization of science in rural areas should be the core guiding ideology of all links for science popularization in ethnic villages; then, the practical requirements of ethnic villages and villagers, the dominant role of villagers, and the value of local and ethnic knowledge should be valued. Among them, the teenagers and the left-behind population are the key forces to improve the general scientific quality of the ethnic villages, and as the major targets in science popularization, they should be paid more attention.

#### 3.3.3 Broader Range of Contents for Selection

Science popularization is a kind of activity adopted to popularize knowledge related to natural science and social science, disseminate scientific thoughts, carry forward scientific spirit, advocate scientific methods and promote S&T application in ways that are

<sup>11</sup> Proposed in 1950 by William Edwards Deming, a famous quality management expert from US, Deming Circle (PDCA Circle) is a kind of logical working procedure to ensure effective progress of any activity, thus winning wide application in quality management. The four letters are explained as follows: P — Plan, which includes determination of policies and objectives as well as formation of schemes; D — Do, which means taking actions to realize the planned contents; C — Check, which means to summarize the results to find out the right, the wrong, the effects, and the problems; A — Action.

easy for understanding, acceptance and participation.

In view of this, modern S&T knowledge, medical care and living technology should be combined with local and ethnic culture in terms of content selection for science popularization in ethnic villages. In the meantime, the social environment coexisted by diversified cultures in Minority Area of Southwestern China requires that during science popularization in ethnic villages, the principals must stick to the path of combining modern science and technology with local and ethnic knowledge, render full consideration to diversified ecological environment, differentiated economic development and obvious cultural differences between different ethnic groups in Minority Area of Southwestern China, take into account peoples' different needs in different cultural societies, ensure wide and diversified contents for selection, and purposefully disseminate scientific spirit, thought and skill so as to promote communication and exchange between different cultures.

### 3.3.4 Working Mechanism Characterized by Two-Way Interaction

An activity mechanism characterized by two-way interaction and timely feedback should be established by centering upon State's general goal of popularizing science in rural areas and the actual needs of ethnic villages. It is a general trend in the future science popularization work for us, with improvement of villagers' scientific quality and promotion of cultural exchange as our own tasks, to establish a channel for interaction between the principals and the targets based on the scientific guidance of the government to stimulate enthusiasm of grass-root villagers in ethnic villages so as to promote growth of the principals and the targets via interaction and effective feedback.

### 3.3.5 Management Mode in Cycling and Spiral Development

The natural and social conditions in the minority villages of Southwestern China determine that the implementation of science popularization activities at the grass-root level not only requires massive science popularizes, but also requires professional management mode, including dedicated organizations, workers and work ideas; in order to separate science popularization in rural areas from daily administrative affairs, special organization and management departments should be formed and charged by professional science popularizes; the activities should be carried out based on the actual needs of rural areas and farmers. Therefore, made up of planning, execution, feedback and action, the management mode for science popularization in ethnic villages should be developed in cycling and spiral manners along a path of professional management. This is an inevitable choice for future science popularization in ethnic villages.

## CONCLUSION

The typical features in Minority Area of Southwestern China including diverse natural habitats, ethnic varieties and multicultural coexistence should be carefully considered during popularization of science. For the purpose of improving quality of science popularization in Ethnic Villages of Southwestern China, we should first adhere to the principle of seeking truth from facts, and take into account all such eternal factors such as geographical ecology, ethnic group, cultural language, and real science popularization requirements from plan, execution, check and action of work; then, we should persist in the principle of combining positions of the principals and the targets, value the villages' and villagers' dominant role in science popularization, and give play to their role in such work; and finally, we should emphasize the scientific value and dissemination of local and ethnic knowledge, and incorporate them into the contents for selection.

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