

# Poverty Assessment in Terms of Safe Drinking Water, Hygiene Facilities, and Energy of Minority Nationalities\*

—A Case Study on the A Ba Autonomous Prefecture of Tibetan and Qiang Nationalities

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Since 2002, the Trinity Mode has been adopted in China to include safe drinking water and sanitation services in order to change the services into public products of rural communities. These products would contain multi-valued attributes of miniature infrastructure constructions, primary health care, and ecological protection. Poverty reduction demands different policies with extended connotation and changed features, from increasing income to improving welfare services, from a macroscopic to a microscopic viewpoint, from the national level to that of communities, and from the indistinguishable to an individual. Against such background, A Ba Prefecture is selected as the case study area. Safe drinking water and sanitation services, the most important components of basic public health services, are selected as the research object in the study, and both sanitation and health are included in the framework to analyze poverty. Altogether, 5637 valid questionnaires of “The Investigation on Poverty Alleviation in A Ba Prefecture in 2009” have been carefully studied. The study shows that great achievements have been made in alleviating poverty in A Ba by improving the drinking water in rural areas. However, a huge amount of work is needed to apply hygiene facilities and popularize clean energy. Hence, the government’s antipoverty policies should be strengthened in the latter two aspects.

*Keywords:* Minority Nationalities; Safe Drinking Water; Hygiene Facilities; Energy; Poverty

## Introduction

As important components of the Millennium Development Goal (MDG), safe drinking water and environmental sanitation were included in the “health-related public services and facilities” category of the “Poor Urban Population and Health in Developing Countries” report published in June 2009. As Global Public Goods, services related to water and sanitation have been recognized by various international organizations and have been incorporated into governmental agendas in different countries. As early as the 1980s, the effort to improve the services related to safe drinking water and environmental sanitation has been regarded as an important strategy in alleviating poverty. Related work was later considered to be part of poverty reduction in financially supported countries when the World Bank and the International Monetary Fund started the Poverty Reduction Strategy in 1999. Muhammad Yunus, the Nobel Peace Prize Winner, created “Sixteen Decisions” in 1984, which determines whether one client can make a loan from the Grameen Bank and whether clients have successfully reduced poverty. An important index in the criteria of “Sixteen Decisions” was the improvement of water and environmental sanitation, which is also a main part of the poverty reduction program in China in the mid-1990s. The Poverty Relief Office of the

State Council pointed the condition of drinking water for human beings and livestock as one participatory poverty index in the poverty reduction of 27 provinces/autonomous regions, together with the coverage of electricity and roads in villages. In recent years, the improvement of water and environmental sanitation in China has been regarded as the main component of poverty reduction by such organizations as the World Bank, the United Nations Children’s Fund, the Asian Development Bank, and the United Kingdom’s Department for International Development. In this field, the Poverty Relief Office, the National Development and Reform Committee, the Ministry of Health, and the Ministry of Water Resources have increased their support in policy and finance (National Center for Rural Water Supply Technical Guidance, 2006). The improvement of water and sanitation is mentioned in “The New Scheme of Medical Reform” to promote the equalization of public health services.

Poverty caused by the lack of energy has a potential impact on health. Access to safe and reliable energy is necessary in an industrial society, though it is not part of the MDG. Energy has a significant influence on ordinary people’s welfare, such as controlling indoor temperature, watching TV, acquiring drinking water and hygiene facilities, and having access to telephones and the Internet, all of which can improve their life condition and health status considerably. The lack of energy results in two different aspects of poverty: 1) clean energy like electricity, gas, and solar energy cannot be reached; and 2) energy consumption takes up too much in a Household Consumption Expenditure, influencing the effective energy utiliza-

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tion. Kaiser and Pulsipher concluded that energy consumption takes up 5% of the family income in middle-high income families, 10% in low-income families, and as high as 20% in extremely poor families. Low-income families can hardly cope with the fluctuation of petroleum prices. Since the 2008 financial crisis, the petroleum price has risen sharply. Recent conflicts in Northern Africa and Middle East countries also push the soaring price even higher, thus posing more challenges worldwide for poor families, especially for children (Wang Xiaoling & Shang Xiaoyuan, 2011).

The lack of safe drinking water, hygiene facilities, and clean energy seriously threatens the health of poor people. Improving the drinking water, hygiene facilities, and energy conditions for poor people has become an important strategy for poverty reduction. Therefore, a case study is conducted in the A Ba Autonomous Prefecture of Tibetan and Qiang Nationalities. Poverty assessment with multidimensional measurement is performed on drinking water, hygiene facilities, and clean energy in the residential regions of Tibetan and Qiang to provide references for formulating antipoverty policies in poverty-stricken areas.

## Literature Review and Theoretical Framework

### Literature Review

Scholars at home and abroad have noticed the close connection between poverty relief and the improvement of water and environmental sanitation. Services relating to safe drinking water and environmental sanitation are cheap or free public services that can be provided for low-income people, and are an investment-oriented redistribution of income. To date, related studies are being carried out around the following points:

**1) The cost-benefit approach and the econometric model can prove that services related to safe drinking water and environmental sanitation possess not only social benefits, but also significant economic benefits.**

Hutton (National Center for Rural Water Supply Technical Guidance, 2006), Fenwick, Sagar, and other scholars from the World Bank, the World Health Organization, and the Asian Development Bank have assessed the projects that improve water and environmental sanitation in some developing countries in Africa and Asia, and have found that all the services have significant economic benefits. Hutton, Haller, and Bartram have assessed the input and output of water and environmental sanitation using the cost-benefit approach, and have cited that in certain developing regions, a one-dollar input may bring 5 to 46 dollars in return. With the help of the Bayesian theory, Paul, Hunter, Pond, and Jagals John found that the proportion of benefits to cost is 2.78 in terms of improving safe drinking water and environmental sanitation in some areas in the three developed countries.

Using a comparative method and epidemics assessment, domestic scholars like Tao Yong (2005), Lu Huang-Xiang, and Zhang Zhi-Yong have analyzed the positive benefits of improving water and environmental sanitation, such as preventing diseases, reducing the time for fetching water, enriching the hygiene knowledge of ordinary people. Water conservancy scholars like Yang Xiao-Liu (2004) and Zhang Ji-Jun (2006) have measured the cost and benefits of potable water projects using basic theories in architectural engineering. Based on the

observation, economists in agriculture and forestry, like Chen Mo, Zhang Lin-Xiu, Qu Yin-Li, and Luo Ren-Fu, have concluded that the enhancement of rural residents' health is determined by the provision of safe and reliable domestic water.

**2) Services related to safe drinking water and environmental sanitation play an important role in relieving poverty and vulnerability.**

Peter Harvey based his study in sub-Saharan Africa on literature analysis and empirical study, and found the close connection between poverty relief and the improvement of water and environmental sanitation. The sustainable improvement of water and environmental sanitation were highlighted as the keys to relieving poverty. Through abundant empirical study, domestic scholars such as Li Bin, Li Xiao-Yun, and Zuo Ting proved that the lack of safe water and environmental sanitation lessened poverty reduction, and worse, broke its persistence. Zhou Xiang-Hong (2009) probed into the effect of the improvement of water and environmental sanitation on reducing the vulnerability of poor rural areas in China through literature analysis and case study. Recently, an empirical study on the national conditions survey of Village Li in Jiangsu Province was performed by the Chinese Academy of Social Sciences. The study indicated that besides strengthening infrastructure construction and agricultural insurance, antipoverty policies should involve popularizing knowledge on hygiene, health, nutrition, and childcare, increasing the investment in medical services, improving basic medical treatment and public health, and raising the general level of impoverished people's health even without enough material conditions. Han Zheng (2004) mentioned that the rural population in China was gradually eliminating poverty, but was still highly vulnerable. Meanwhile, compared to traditional poverty-reduction policies (e.g., new rural cooperative medical system, social assistance, etc.), elementary health care (e.g., services related to safe drinking water and environmental sanitation) can be realized in advance through interventions. Advance intervention can effectively identify groups that will soon sink into poverty and relieve the long-term poverty of an impoverished population. Moreover, it can raise the effectiveness of policies while reducing the cost.

**3) Services related to safe drinking water and environmental sanitation can promote the capacity building of an impoverished population.**

Empowerment was initially regarded as one of the three mainstays of poverty reduction in the World Bank's "World Development Report of 2000/2001". Since the report, many scholars have tried to include empowerment in the discussion of poverty reduction. In *Measuring Empowerment in Practice: Structuring Analysis and Framing Indicators* (WPS 3510), Ruth Alsop and Nina Heinsohn stated that the capacity of individuals and organizations can be enhanced significantly in water and environmental sanitation projects. The United Nations Children's Fund and other international organizations have all emphasized the effect of the Trinity Mode on the capacity building of an impoverished population in improving water and environmental sanitation in China. Women in the selected villages of Shanxi and Yunnan were observed to have more confidence after joining the work to improve water and environmental sanitation. In rural India, Bennett and Gajurel found that the Dalits and Janajatis women were empowered with the intervention of water supply and hygiene projects, and thus enjoyed more social inclusion.

**4) The Application of Multidimensional Poverty Meas-**

### urement and the Quantization of its Main Dimensions.

Since the 1970s and 1980s, the Physical Quality of Life Index, Human Development Index, mode of basic needs, integrated rural development, and comprehensive development program have been used widely as multidimensional indicators. These indicators include various dimensions of life—lifespan, knowledge, and dignity, among others—though each comprehensive indicator has its own focus. Based on the poverty relief practice in Qinghai Province, Hu An-Gang (2004) classified poverty into four classes: income poverty, human poverty, information poverty, and ecological poverty. According to the 17 indicators of the four classes, a comprehensive measurement was formed to conduct a quantitative calculation of poverty reduction in Qinghai. Chen Li-Zhong (2008) chose the Watts Multidimensional Poverty Indicator and its decomposition after comparing the H-M Index, HPI Index, CH-M Index, F-M Index, and W-M Index. The multidimensional indicators of knowledge poverty, health poverty, and income poverty were established. The current conditions of some poverty-stricken towns in China were measured using the newly established indicators. Wang Xiao-Lin (2010) measured the multidimensional poverty in urban and rural families in China using the framework in “Counting and Measurement of Multidimensional Poverty” by Alkire and Foster (2008) of Oxford University, and mentioned that other kinds of multidimensional poverty exist besides income poverty.

In recent years, vulnerability, social capital, and other quantitative measurements of main dimensions within the multidimensional system have become important topics in academic study. In 1995, the World Food Program has proposed an analytical framework of an impoverished population’s vulnerability, showing that the higher the risk of an impoverished population, the higher their vulnerability will be. Dercon (2001) created an analytical framework of risks and vulnerability, in which the farmers’ risks mainly include asset risks (human assets, land assets, material assets, financial assets, public goods, and social assets), income risks (profitable activities, assets returns, assets disposal, savings-investment, remittance transfer, and economic opportunities), and welfare risks (nutrition, health, education, social exclusion, and capability deprivation). This framework places the farmers’ resources, income, consumption, and corresponding institutional arrangement into one system (Chen Chuang-Bo, 2005). Li Xiao-Yun (2005) studied the qualitative analysis on the vulnerability of impoverished peasant households using the framework of sustainable livelihood of peasants, and then designed the quantitative study on the livelihood assets of peasant households to perform a quantitative analysis on the peasants’ vulnerability.

### Theoretical Framework

“Poverty” is defined as “one’s state of lacking a certain amount of or acceptable amount of material possessions or money” in Encyclopedia Briton NICA. It is also defined as “the phenomenon of being deprived of welfare” by the World Bank (World Bank, 2009). The definition of “poverty,” therefore, is determined by how many material possessions or money is acceptable in the society. Due to the restriction of the accessibility and measurement of data, poverty and welfare have been calculated by the monetary standard of average income or consumption. Thus, poverty means that the income or consumption meeting basic needs is lower than a certain amount of money.

On account of this logical analysis, antipoverty policies and welfare policies evolve around income-support policies. This logical thinking has seriously confined the development of antipoverty policies.

Amartya Sen cited that poverty is more about the deprivation of basic capacities than low income. The deprivation of basic capacities can be manifested by premature mortality rate, evident malnutrition (especially for children), persistent incidences of diseases, and other shortages (Sen, 1985). Both definitions of poverty and the strategies of poverty relief have been extended under Sen’s framework of capacities. In the United Nations’ MDG in 2000, it was clearly stated that “by 2015, the rate of unsustainable access to safe drinking water and basic hygiene facilities should be halved,” which can be regarded as a landmark. The United Nations regards the lack of safe drinking water and basic hygiene facilities as one primary dimension of poverty. Similarly, the health of an impoverished population is influenced negatively due to the use of animal wastes, straw, firewood, and raw coal as fuel in poverty-stricken households, causing serious damage to the environment. Therefore, the use of clean energy is also an important subject under discussion concerning poverty and development.

Since Sen proposed the concept of depriving basic capacities, great progress has been made in the understanding of poverty. In certain regions, however, some major dimensions of poverty, such as hygiene facilities and clean energy, have not been widely accepted in public policies. Safe drinking water, hygiene facilities, and clean energy are the main blocks in building an overall prosperous society and improving living standards, especially in minority areas.

In this article, the logical framework is set as “poverty—the deprivation of welfare—basic needs—basic capacities”. The capacities of acquiring safe drinking water, hygiene facilities, and clean energy are confirmed as the basic capacity to be used as primary dimensions in antipoverty strategies. Under this theoretical framework, the state of poverty in A Ba Autonomous Prefecture is analyzed in terms of minorities and gender.

### Data

In this article, the survey data of “The Investigation on Poverty Alleviation in A Ba Prefecture in 2009” were used, covering the 1351 villages of 13 counties in A Ba Prefecture. Of the 6755 total questionnaires, only 5637 valid questionnaires were returned.

### Analysis and Results

#### Drinking Water and Health

**1) Great achievements in safe drinking water in A Ba Prefecture.** In this report, tap water and wells deeper than five meters are considered as sources of safe drinking water, whereas rainwater, rivers, ponds, and wells with depths of less than 5 meters were considered as sources of unsafe drinking water. “The Investigation on Poverty Alleviation in A Ba Prefecture in 2009” shows that 75.5% of water sources in A Ba is safe, 71% of which are comprised of households with tap water (Table 1).

**2) Great Achievements in Public Investments for Poverty-Relief Development.** Due to the success of several projects (i.e., the investment for poverty-relief development, the integrated control of the Kaschin-Beck disease, the improve-

**Table 1.**  
Sources of drinking water in various residential areas of A Ba Prefecture.

| Type                     | Sources of Safe Drinking Water |                   |                   | Sources of Unsafe Drinking Water |           | Total  |
|--------------------------|--------------------------------|-------------------|-------------------|----------------------------------|-----------|--------|
|                          | Tap Water                      | Wells (>5 Meters) | Wells (<5 Meters) | Rivers and Ponds                 | Rainwater |        |
| Number of Households     | 3946                           | 248               | 196               | 1089                             | 77        | 5556   |
| Agricultural Regions     | 2807                           | 94                | 77                | 614                              | 58        | 3650   |
| Farming-Pastoral Regions | 981                            | 66                | 73                | 243                              | 15        | 1378   |
| Pastoral Regions         | 158                            | 88                | 46                | 232                              | 4         | 528    |
| Percentage (%)           | 71.02                          | 4.46              | 3.53              | 19.60                            | 1.39      | 100.00 |
| Farming Regions          | 76.90                          | 2.58              | 2.11              | 16.82                            | 1.59      | 100.00 |
| Farming-Pastoral Regions | 71.19                          | 4.79              | 5.30              | 17.63                            | 1.09      | 100.00 |
| Pastoral Regions         | 29.92                          | 16.67             | 8.71              | 43.94                            | 0.76      | 100.00 |

ment of water and toilets in rural areas), the rate of using tap water in rural areas of A Ba has clearly increased. In the past, people in A Ba's endemic areas had to drink high-fluorine water or standard water. This problem was included in the livelihood project of A Ba in 2008, together with the investments on poverty-relief development and the integrated control of the Kaschin-Beck disease. By the end of November 2008, 521 safe drinking water projects had been completed, providing safe drinking water to 85,000 local people (The Web Portals of the Government of A Ba Prefecture, 2009).

**3) Challenges of Safe Drinking Water Supply for Rural Residents.** In recent years, 75% of the households have gained access to safe drinking water through poverty-relief development. However, 24.4% of the households still do not have access to safe drinking water, 3.53% drink water from wells no deeper than five meters, 19.60% drink water from rivers and ponds, and 1.39% drink rainwater.

**4) Pastoral Regions—The Area of Focus in the Improvement of Safe Drinking Water Supply.** Table 1 shows that a connection exists between drinking water and residential regions. Only 29.9% of the households in pastoral regions have access to tap water while 53.4% have to endure unsafe water sources (wells no deeper than five meters, rivers, ponds, and rainwater). This is a serious problem in A Ba prefecture because safe drinking water has a close connection with health.

**5) Qiang and Tibetan—The Minority Nationalities focused on in the Improvement of Safe Drinking Water.** Table 2 shows that the condition of safe drinking water in the Han and Hui residential regions is better than those in Qiang and Tibetan. A total 37.5% and 24.53% of households in the residential regions of Qiang and areas of Tibet, respectively, have unsafe drinking water. In Han area, the condition is better, with only 12.79% of households taking unsafe drinking water. The Hui area has the best condition, with only 11.42% of the households taking unsafe drinking water.

## Hygiene Facilities and Health

**1) A small proportion of rural households in A Ba Prefecture use safe hygiene facilities.** Table 3 shows that the rural households with safe hygiene facilities only take up 12.4%, i.e., 87.6% households have no hygiene facilities. Compared with the data of different residential regions, more households

in farming regions adopt safe hygiene facilities than those in pastoral and farming-pastoral regions. However, the general condition of A Ba Prefecture is not satisfactory, and it faces a difficult task of improving toilets in rural areas. Altogether, 87.6% of the households need improvement of toilets, and the rate becomes 96.1% in pastoral regions.

**2) In terms of unsafe hygiene facilities, Tibetan residents have the highest rate while Qiang residents have the lowest.** The rates of using unsafe hygiene facilities in Tibetan, Hui, Han, and Qiang residential regions are 91.21%, 84.29%, 82.54%, and 79.19%, respectively. For most urban residents, flush toilets are already a part of their lives, but not for rural residents in A Ba Prefecture. The United Nations regards unsafe hygiene facility as an important factor that endangers health. Therefore, the rate of unsustainable access to basic hygiene facilities in MDG should be halved by 2015. Unfortunately, the use of unsafe hygiene facilities is often underestimated in the public policies of poverty-stricken areas. Unsafe hygiene facility, like unsafe drinking water, is also a main factor that causes epidemic diseases such as malaria and dysentery.

**3) There is a positive correlation between the type of toilets and the health condition of rural residents in A Ba Prefecture.** Table 5 shows the comparison of the self-assessment of rural residents on their own health based on the types of toilets used. The table shows that the group who chose "very good" for their health conditions has the highest proportion (10.6%) of using indoor flush toilets. In contrast, those who chose "very bad" for their health conditions have the highest proportion of using open latrine earth pits (16.0%) or have no toilets at all (58.0%). Among the 169 households who chose "very bad" for their health conditions, none uses indoor flush toilets. This phenomenon is connected with the economic condition, i.e., better-off households tend to use "indoor flush toilets." Therefore, there is a certain connection between the type of toilets and the health condition of rural residents, which proves that government intervention is needed in the improvement of lavatories of impoverished rural residents.

## Lighting and Fuel

**1) Electricity for lighting is not available to a quarter of rural residents in pastoral regions of A Ba Prefecture.** Table 6 shows that 95.5% of rural households in A Ba Prefecture

**Table 2.**  
Sources of drinking water in A Ba Prefecture in terms of nationalities.

| Type                 | Sources of Safe Drinking Water |                   |                   | Sources of Unsafe Drinking Water |           | Total  |
|----------------------|--------------------------------|-------------------|-------------------|----------------------------------|-----------|--------|
|                      | Tap Water                      | Wells (>5 Meters) | Wells (<5 Meters) | Rivers and Ponds                 | Rainwater |        |
| Number of Households | 4071                           | 253               | 197               | 1106                             | 78        | 5705   |
| Tibetan              | 2525                           | 190               | 156               | 684                              | 42        | 3597   |
| Qiang                | 577                            | 22                | 14                | 308                              | 32        | 953    |
| Hui                  | 110                            | 14                | 8                 | 8                                | 0         | 140    |
| Han                  | 854                            | 26                | 19                | 106                              | 4         | 1009   |
| Others               | 5                              | 1                 | 0                 | 0                                | 0         | 6      |
| Percentage (%)       | 71.36                          | 4.43              | 3.45              | 19.39                            | 1.37      | 100.00 |
| Tibetan              | 70.20                          | 2.28              | 4.34              | 19.02                            | 1.17      | 100.00 |
| Qiang                | 60.55                          | 2.31              | 1.47              | 32.32                            | 3.36      | 100.00 |
| Hui                  | 78.57                          | 10.00             | 5.71              | 5.71                             | 0.00      | 100.00 |
| Han                  | 84.64                          | 2.58              | 1.88              | 10.51                            | 0.40      | 100.00 |
| Others               | 83.33                          | 16.67             | 0.00              | 0.00                             | 0.00      | 100.00 |

**Table 3.**  
The use of hygiene facilities (toilets) in various residential areas of A Ba Prefecture.

| Type                     | Number of Households |      |       | Percentage (%) |      |       |
|--------------------------|----------------------|------|-------|----------------|------|-------|
|                          | Unsafe               | Safe | Total | Unsafe         | Safe | Total |
| Farming Regions          | 3151                 | 559  | 3710  | 84.9           | 15.1 | 100.0 |
| Farming-Pastoral Regions | 1278                 | 118  | 1396  | 91.6           | 8.5  | 100.0 |
| Pastoral Regions         | 511                  | 21   | 532   | 96.1           | 4.0  | 100.0 |
| A Ba                     | 4940                 | 698  | 5638  | 87.6           | 12.4 | 100.0 |

**Table 4.**  
The use of hygiene facilities (toilets) of rural residents in A Ba Prefecture in terms of nationalities.

| Type    | Number of Households |      |       | Percentage (%) |       |       |
|---------|----------------------|------|-------|----------------|-------|-------|
|         | Unsafe               | Safe | Total | Unsafe         | Safe  | Total |
| Tibetan | 3320                 | 320  | 3640  | 91.21          | 8.79  | 100.0 |
| Qiang   | 784                  | 206  | 990   | 79.19          | 20.81 | 100.0 |
| Hui     | 118                  | 22   | 140   | 84.29          | 15.71 | 100.0 |
| Han     | 837                  | 177  | 1014  | 82.54          | 17.46 | 100.0 |
| Others  | 5                    | 1    | 6     |                |       |       |
| Total   | 5064                 | 726  | 5790  |                |       |       |

**Table 5.**  
The crosstab of self-assessment on health and the toilet types in A Ba Prefecture (%).

| Health Condition | None | Indoor Flush Toilets | Indoor Toilets (Without Water) | Outdoor Flush Toilets | Sanitary Toilets (Without Water) | Open Latrine Pits of Cement | Open Latrine Pits of Earth | Others | Total |
|------------------|------|----------------------|--------------------------------|-----------------------|----------------------------------|-----------------------------|----------------------------|--------|-------|
| Very Good        | 7.2  | 10.6                 | 0.8                            | 5.3                   | 5.9                              | 20.2                        | 44.4                       | 5.6    | 100.0 |
| Good             | 12.4 | 7.0                  | 0.7                            | 3.1                   | 5.5                              | 16.6                        | 49.3                       | 5.5    | 100.0 |
| Ordinary         | 14.2 | 2.8                  | 0.4                            | 3.1                   | 4.8                              | 14.4                        | 53.7                       | 6.6    | 100.0 |
| Bad              | 14.7 | 1.5                  | 0.5                            | 3.0                   | 3.5                              | 14.2                        | 57.7                       | 4.9    | 100.0 |
| Very Bad         | 16.0 | 0.0                  | 1.2                            | 1.2                   | 4.1                              | 15.4                        | 58.0                       | 4.1    | 100.0 |
| Total            | 13.3 | 4.5                  | 0.6                            | 3.2                   | 4.9                              | 15.5                        | 52.3                       | 5.8    | 100.0 |

are provided with electric lamps for lighting. In pastoral regions, however, 28.38% of households still use oil lamps for lighting. Hence, the government should focus on the improvement of rural household electricity in pastoral regions.

**2) Tibetan is the nationality for whom lighting should soon be improved.** Table 7 reveals that electricity or biogas lamps are not available to 248 out of 3392 Tibetan households, which comprise 6.81% of the total A Ba population.

**3) Firewood is used as the main fuel in cooking by rural residents in A Ba Prefecture, and the improvement in cooking using ovens should be made in rural areas in the future.** Traditional fuels like firewood and animal wastes are used for cooking in farming, farming-pastoral, or pastoral regions of A Ba Prefecture (Table 8). Therefore, the lifestyle of most rural households in A Ba Prefecture is still quite traditional with regard to fuel. An improvement in cooking using ovens should be made in A Ba Prefecture to protect the environment and to save resources by popularizing the use of clean energy sources.

## Conclusion

1) The development of poverty reduction policies is severely constrained by the traditional definition of poverty, which emphasizes the difference in income or expenditure. Therefore, in traditional poverty reduction policies, the support in raising

income (e.g., the social security and assistance) is considered more important than enhancing the basic capacities of local people. Although income is an important factor in enhancing capacities, other factors should also be considered. The empirical investigation in A Ba Prefecture proves that it is more practical at present to emphasize non-income factors like acquiring safe drinking water, hygiene facilities, and clean energy.

2) In the services related to safe drinking water and environmental sanitation, the “Trinity Mode” is applied, referring to the three aspects of “water”, “environmental sanitation”, and “health education” that are implemented at the same time. “Water” refers to “safe drinking water”, which involves the improvement of water quality, water yield, convenient water fetching, and coverage rate of tap water. “Environmental sanitation” means “basic individual hygiene facilities”, which covers newly built or rebuilt lavatories and the non-hazardous treatment of excreta. “Health education” includes the popularization of health knowledge about water and environmental sanitation, which can lead to the change in individual behaviors. Thus, the improvement of water and environmental sanitation involves many interacting aspects, other than just the sole increase of income. From the basic condition in A Ba Prefecture, public policies, especially those improving livelihood and reducing poverty, should focus on hygiene facilities and clean energy. Public finance and cultural influence are needed in this process. Only in this way can people live more happily with

**Table 6.**

Lighting types of rural households in various residential regions of A Ba Prefecture (%).

|                          | Electric/Biogas Lamps | Oil Lamps/Candles/etc. | Total | Electric/Biogas Lamps (%) | Oil Lamps/Candles/etc. (%) | Total  |
|--------------------------|-----------------------|------------------------|-------|---------------------------|----------------------------|--------|
| Farming Regions          | 3653                  | 57                     | 3710  | 98.46                     | 1.54                       | 100.00 |
| Farming-Pastoral Regions | 1136                  | 60                     | 1396  | 95.70                     | 4.30                       | 100.00 |
| Pastoral Regions         | 381                   | 151                    | 532   | 71.62                     | 28.38                      | 100.00 |
| Total                    | 5370                  | 268                    | 5638  | 95.25                     | 4.75                       | 100.00 |

**Table 7.**

Lighting types of rural households of various nationalities in A Ba Prefecture (%).

|         | Electric/Biogas Lamps | Oil Lamps/Candles/etc. | Total | Electric/Biogas Lamps (%) | Oil Lamps/Candles/etc. (%) | Total  |
|---------|-----------------------|------------------------|-------|---------------------------|----------------------------|--------|
| Tibetan | 3392                  | 248                    | 3640  | 93.19                     | 6.81                       | 100.00 |
| Qiang   | 983                   | 7                      | 990   | 99.29                     | 0.71                       | 100.00 |
| Hui     | 140                   | 0                      | 140   | 100.00                    | 0.00                       | 100.00 |
| Han     | 999                   | 5                      | 1014  | 98.52                     | 1.48                       | 100.00 |
| Others  | 5                     | 1                      | 6     | 83.33                     | 16.67                      |        |
| Total   | 5519                  | 271                    | 5790  | 95.32                     | 4.68                       | 100.00 |

**Table 8.**

Fuel types used by rural residents in A Ba Prefecture (%).

| Type                     | Coal | Electricity | Liquefied Gas/Natural Gas | Biogas | Firewood | Others | Total  |
|--------------------------|------|-------------|---------------------------|--------|----------|--------|--------|
| Farming Regions          | 1.43 | 14.37       | 1.73                      | 2.33   | 78.13    | 2.00   | 100.00 |
| Farming-Pastoral Regions | 0.65 | 2.80        | 0.65                      | 0.29   | 87.86    | 7.76   | 100.00 |
| Pastoral Regions         | 2.08 | 0.38        | 2.46                      | 0.00   | 39.13    | 55.95  | 100.00 |
| Total                    | 1.30 | 10.19       | 1.53                      | 1.60   | 76.87    | 8.51   | 100.00 |

more dignity.

Against the background of economic globalization, the educational level and health condition of laborers in one country or one region determine not only the material capital investment, but also its market competitiveness. In developing countries, poverty can be lessened with the improvement of the basic capacities of entire laborers through income redistribution and investment in basic education and medical services. The economy may grow with the general development of human resources. Drinking water and environmental sanitation are regarded as important components of public health services in rural areas. Their improvement can directly reduce water-related diseases and trading hours of labor. Moreover, the ecological environment can be protected, the health cognition of local villagers can be effectively converted, and the villagers' participation in public services can be encouraged as attributed to the application of the "Trinity Mode." The improvement of water and environmental sanitation becomes increasingly meaningful in improving the quality of life, converting the lifestyle, and lessening the poverty of the poverty-stricken population in western China. Local governments should include the quality of environmental sanitation into the overall plan of economic and social development, and set an agenda particularly for this issue. The formulation of such policies can guarantee the healthy and sustainable development of the economy and the society.

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