Local people mobilization for China's reforestation project

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Abstract

We use resource mobilization theory to analyze local farmers' motivation in participating China's reforestation project. Samples from the Province of Ningxia and Beijing were interviewed and their environmental awareness, relationship nets, media access, and attitudes toward the reforestation project were collected. It is shown that collective psychological grievance of environmental degradation does exist and can serve as the mobilizing basis. Besides, close network between city and rural areas and mass media could help enhance such mobilization. However, economic compensation is still indispensible in the promotion process of the reforestation project

Key Words: reforestation project, China, people mobilization, environmental awareness

Introduction

The Yellow River, the second longest river in China, is often compared to China's Mother River. Millennia ago, Chinese civilization emerged from along this river. And now it drains a basin of 795,000 sq km, which nourishes 120 million people.

However, the Yellow River has become a danger river. In the middle reaches, the Yellow River flows across the heavily eroded Loess Plateau and takes away excessive silt. This accounts for over 90 percent of the sediment in the main channel downstream. The increasing sediment deposits have raised the riverbed several meters over the surrounding grounds. Traditional efforts in taming the river concentrate on flood prevention by raising and strengthening levee embankments lining both the north and south shores of the channel. Although the levee built higher and higher, more and more floods threaten this river and the people living along it. After the massive flood in 1998, Chinese government recognized that only by modifying the Aeolian loess could we eradicate the problem of Yellow River's flood. Thus, a greening policy aiming at turning cultivated farmland into forest and grassland surfaces around 1999. Now, this policy has spread to 25 provinces in China. According to this policy, farmers in specific areas should stop farming or grazing and plant trees or grass on their land. Most of these areas are vulnerable to wind or rainfall erosion. And farmers could get cash and grain from the government as compensation accordingly.

While this policy brings a sound beginning of China's soil conservation and environmental improvement, its sustainability still remains a problem. If the policy's performer, say the local farmers, could not identify with this policy, they would cut down the trees and re-cultivate crops on the land after the compensation period. If it is the case, the reforestation program would make no sense except wasting huge amount of public financial resources for several years.

This paper tries to examine Chinese farmers' identification with the reforestation and other environmental policies. Although the formulation and execution of the reforestation policy are governmental behaviors, the analysis from a social movement perspective would cast some light on this issue. The peasant population in China is very large and most of them live on a self-satisfying basis, so the cost of external supervision on them is really high. That means the execution of the reforestation policy may be very inefficient if we use a traditional up-down monitoring method to enforce this policy. On the contrary, if we take the farmers here as the public to be mobilized in a social movement and our governors just mobilize the farmers to work in the expected direction, not force them to, we could gain better policy effect with much less cost. Actually, it could be taken as a collective behavior to let so many farmers work under the same aim, say turning cultivated farmland into forest and grassland. According to Smelser (1963), *shared grievance and generalized beliefs play an important role in the emergency of a social movement in a collectivity. Before collective action is possible, a generalized belief is necessary concerning the causes of the discontent and the modes of redress.* It serves as the basis and driven force of collective behavior. Many empirical tests have consolidated such a proposition (Levy 1970 and Morrison 1971). From this viewpoint, generalized concern about the increasingly alarming environment problems among farmers would push the farmers to adapt environmental-friendly farming method. And they would accept the government's reforestation policy more willingly.

Another relative theory is resource mobilization. Although the viewpoints in this theory differ radically from, if not oppose to, the traditional social movement theories we discussed above, some significant inference could still be derived from it. The resource mobilization approach emphasizes the interaction between resource availability, the preexisting organization of preference structures, and entrepreneurial attempts to meet preference demand (Mayer and John, 1987). It examines the variety of resources that must be mobilized, such as time, money, human resources, and political opportunities. It also introduced the details for resource

mobilization, including support base raising, institution building, strategy and tactics, and communication. (Lecture notes from Dorceta Taylor, 2008). It is argued that it is the intentional combination of these mobilizing techniques for the various resources that lead to collective behavior and social movements, rather than the shared grievance. Under the same theory frame, Oberschall (1973) claims that incentives, cost-reducing mechanisms, and career benefits also could contribute to collective behavior. Generally speaking, the resource mobilization theory is more institutionalized and emphasis more on social movement leaders' rational organizing strategy than the emotional factors. So it could be easily extend to policy enforcement and help analyze how to mobilize Chinese farmers to behavior in line with the policy orientation of environmental protection.

Besides the theoretical foundation, the experiences of real social movement organization and resource mobilization would also lend some significant suggestion to the improvement of reforestation policy enforcement in China. Undoubtedly, the first case should be discussed here is Lois Gibbs' organization of protest against hazard materials in Love Canal. In this process, participants held meetings and set goals at the very beginning of the collective protest. What's more, they collected data and plotted the result to convince the residents of the danger in Love Canal. Besides, they use old aerial photographs, geological survey maps and personal photographs, and scientist's health study to enhance their demonstration (Center for Health, Environment and Justice, undated). Here, it could be concluded that a clear objective and sufficient evidence of the underlying hazard or disadvantages play a vital role in attracting people to take part in a social movement. The common fear about the horrible result could be taken as collective grievance as the traditional social movement theory said. Or it could be ascribed to a people-mobilization tactic used by social activity leaders. No matter which is the case, the general awareness of the negative effect of present situation is the key point since it could be easily transferred to people's real action to change this situation. In the case of Love Canal, it is the protest against hazard materials and facilities. In the case of China's reforestation, it should be farmers' practical effort to improve the environment. What a policy maker should do is to evoke such awareness.

The policy frame of China's reforestation project

Basically, there are two factors that induce the birth of the reforestation project in China. One is the massive flood in 1998, which killed 5,500 people, affected a total of 250 million people, and caused material damage of 30.7 billion dollars. Both the Chinese government and the general public were shocked. This prepared a timely psychological basis for the emergency of the reforestation project that aimed at improving China's ecological environment and reducing the probability of the occurrence of extreme natural disaster. The other one is the affluent grain reserve around the end of the 20th century. At that time, the supply largely overweighed the demand in China's grain markets. This provided a sufficient material basis for the execution of the reforestation project. Using the extra grain reserve, Chinese government could make compensation to the farmers who converted their farm land into forest as the reforestation required and guarantee the project advancing smoothly.

In 1999, three provinces, say Sichuan, Shanxi, and Gansu, began the trial implementation of this project. In 2000, it extended to 13 provinces, 20 provinces in 2001, and 25 provinces in 2002. Now this project influences more than two thirds of China's provinces and is the most fundamental environment project throughout the whole country.

Basically speaking, this is an up-down policy. The government use administrative method to require farmers in certain areas to plant nothing other than trees or grasses on their land. Moreover, the government assigned certain species of trees or grasses as a part of the policy in order to gain a sound effect of water and soil conversation. In this case, farmers lost their original source of income. As compensation, the government paid the farmers cash subsidy, grain subsidy, and sometimes extra seed subsidy, if the seeds of trees or grasses are not distributed to the farmers. When determining the subsidy standard, policy makers took the original average income level of local farmers as the key reference.

Such a policy system faces mainly four problems. Firstly, some farmers would not like to carry out this policy since the compensation is lower than their original income. As discussed above, the subsidy standard was made out primarily according to the average income level in certain area. Definitely, if there is no the reforestation policy, the upper average farmers could earn more than the subsidy they get now. So there is no economic incentive for these farmers to do what the policy requires them to do. Secondly, farmers are exposed to more risk under this

policy than in their former crop-planting status. As the rules for reforestation say, the subsidy does not go into the farmers' account automatically. Each year, the farmers could get the full subsidy only if the growing situation of their trees or grasses passes through a series of administrative examinations. However, the growing of young trees and grasses could be affected by the weather a lot. If encountering a bad weather, farmers could get little subsidy from the government, and their livelihood would become very hard that year. So some farmers would rather turn back to their crops. Although the crop would also suffer from bad weather, the relative risk is much lower since farmers could always get something to feed up themselves in this case. Thirdly, under the present frame, China's reforestation policy is not sustainable. The government would only provide subsidy in the trees or grasses growing periods, say about five to eight years. After that, it is assumed that farmers should transfer to forest operators and run their forest in a economic sustainable way. They could earn money by selling the forest products, run forest tourism, or other forest related commercial business. Under such expectation, farmers would like to plant economic forest rather than ecological forest if they could choose between them freely, since the economic forest could produce more cash flow in the future. However, the economic forest could not conserve water and soil as effectively as the ecological forest do. This would weaken the reforestation project's effect largely compared to the original expectation. In order to avoid this embarrassment, the government assigned specific tree species to farmers coercively. Most of them are ecological trees. In this case, the farmers have no choice but to plant ecological forest. But after the compensation period, they have extensive tendency to cut down the trees and replant crop on the land designed for forest. This would lead to a totally failure of the reforestation policy. Fourthly, the government should consider the financial resources for the reforestation policy seriously. Although the executants of this policy are only farmers, the participants are the whole country since most of the funding for this policy comes from taxation. In order to maintain a sustainable financial resource, the government should convince all the tax payers that the reforestation is really in urgent need, rather than just advertising this policy to local farmers.

All these problems result from the over-emphasis of economic incentive. No matter how perfect the incentive mechanism designed, only by economic means could not we incorporate all the public benefits into individual's preference. If the economic profit is everything, definitely, farmers would calculate the benefits of planting crops and trees on their land, would compare

them, and would choose the more profitable one. Usually, crops would beat trees. The reason is that homo economicus emphasis more on the present and discount more on the future. And crop-planting benefit comes much earlier than trees.

So here what we should really pay attention to is the public's concern about China's environmental problems and their danger to our living. Only when the majority farmers find that environmental pollution, degradation, and deprivation are threatening the livelihood of them and their descendants could they be willing to devote their time and energy to ecological environment improvement, even without that attractive compensation. Therefore, while using economic incentive method to encourage farmers to carry out the reforestation policy, the government should consider mobilizing the farmers and make their behavior conform to the general public's willingness.

How can the farmers be mobilized rather than be incented? Maybe sociologists are more skillful at this aspect. They have plentiful experiences in launching large-scale social movement, in collecting various resources into this movement, and in persuading people of the significant of this movement. So the policy makers of the reforestation policy should learn from the sociologists and social activists if they want their policy carried out successfully. Admittedly, most of the time, social movements aim at opposing and overriding unjust policies and social activists work against politicians, which lead to totally opposite working frames between the policy makers and policy objectors. This would bring some difficulties in transferring experiences between them. However, in the sense of mobilizing large amount of resources and people into a collective behavior, no matter a social movement or a public policy execution, they are similar. Both of them work as organizers. Both of them intend to bring a certain kind of change to the society. And both of them need the support from the general public. So, in this sense, policy makers should learn and borrow ideas from their opponent, say the sociologists and social activists, who have the super ability in the mobilizing common public.

This paper tries to provide some suggestion to the implementation and improvement of China's reforestation policy from a sociological perspective. Farmers' willingness and capabilities of accepting such a policy are emphasized. Specifically, we analyze the farmer's environmental awareness, rural environmental institution building, media's role, network between farmers and urban residence, and the financial resources for supporting the farmers who

join this project. Moreover, we try to identify mobilization barrier rooting from farmer's cognitive defect and then discuss the possible method to overcome these barriers.

Questions and Research Methods

As discussed above, questions from five aspects are included in our questionnaire, environmental awareness, institution, media, network, and financial resources. They all affect the farmers' motivation to join the reforestation project to some extent. The deeper the farmers recognize China's environmental situation and the problem of water and soil erosion, the more willingly will they take part in this project. And more complete environmental institution, stronger media power in advertising the significance of the reforestation policy, and tighter network between farmers would also help promote the extension of this policy. Besides the authoritative evidence transmitted through the public media, advice from relationships and fellows in the same environmental organization or communication with them could also play a major role in convincing the farmers to join this project. Certainly, financial support is indispensable either for a successful movement or policy. So farmer's income and contribution to environmental organizations are also involved in our survey.

Therefore, a total of 17 questions were asked in these aspects, including people's attitude toward fertilizer, pesticides, hillsides, compensation, as well as their environmental knowledge, farmer-relatives and farmer-friends. What's more is the institutional questions, including the ways people get environment related information and the extend they participate in environmental organizations. All these questions constitute the core part of our survey. Similar to other sociological survey, our survey also covers the demographic information, including gender, age, race, education, income, and family situation. The demographic characteristics may affect people's attitude towards the environmental polices. Moreover, analyzing sample in the same demographic group could eliminate the unnecessary disturbance.

This questionnaire was distributed to two sub-groups, 15 farmers in Jingyuan County, Ningxia province and 15 residents in Beijing. Jingyuan is located at the south end of Ningxia Province[1] (Figure 1) with an area of 1131 square kilometers. 92.5% of the population live on farming. Jingyuan is part of the Liupanshan Natural Reserve, one of the most important natural

[1] Ningxia is in the upper reaches of the Yellow River.

reserves on Loess Plateau. 60% of its land is required to be used to development forest or pasture. Beijing is the capital, as well as the political, economic, and cultural center of China. Most national policies were formulated here. People here could expose themselves to much more information. And the average education level in this city is also higher than the national average. Generally speaking, Beijing is one of the most developed cities in China. So the subgroup samples in Beijing could work as an ideal representative of China's city residents. Their environmental awareness and attitude toward the reforestation policy is a good indicator of that of the whole city people in China. Although the city people do not participate directly in the implementation of the reforestation policy, they could still provide technical, information and financial support to it in indirect ways, for example improving and transferring the tree-planting technique, gathering and distributing policy related information, and donating to environmental organizations and movements. So the attitude of this group should also be taken into consideration. On the other hand, we could derive some effective ways to enhance rural people's environmental awareness by analyzing the differences between the urban and rural residents.

The data collection methods in the two places differ slightly. In Ningxia, volunteer graduates in the west region[2] works as our agents. They help send the questionnaires to their students. The students brought the questionnaires home and let their parents fill them out. Most of their parents, say the final respondents are local farmers in Ningxia. In Beijing, questionnaires were sent directly and randomly to students, workers, and officers. All the field survey work was done during Nov. 15th, 2008 to Nov. 26th, 2008. Questionnaires were collected and sorted out in China. And final data analysis was finished in Michigan.

Findings

A. Data summary

All the summaries of data were shown in the figures in the appendix. More emphasis is laid on the comparison between the two subgroups. Figure 2 to 5 show the data distribution of family size, work force, children number, and education, respectively. The differences of these

[2] Actually, the volunteers are part of the “plan for college graduates to volunteer services in the western region”, which is initiated by the government aiming at accelerate the development of the underdeveloped western region. The participants of this plan will provide volunteer service in various fields in the western provinces for about one year. Our agents are the volunteer graduates who work as teachers in Ningxia rural secondary school.

demographic situations between the two sub groups are obvious. Compared to the urban families in Beijing, rural families in Ningxia have larger family size, less work force, more children, and family members with less education. Besides, according to our calculation, the average annual family income of Beijing families is less than 10,000 dollars (RMB 63585) and that of Ningxia families is less than 1,000 dollars (RMB 6760)[3]. It is another significant gap between them. This sharply contrary demography situation is just in accordance with the significant disparity between China's city and rural area, between China's eastern part and west part.

Figure 6 to 11 illustrate people's environmental knowledge from different aspects, including their attitude to fertilizer, pesticides, planting on hillside and their recognition of the concept of sustainable development. From Figure 6 and Figure 7, we can see people in Beijing consider the use of fertilizer and pesticides than people in Ningxia. More people in Beijing think we are using too much fertilizer and the use of pesticides is bad for environment. On the contrary, farmers in Ningxia take a moderate acceptance of fertilizer and pesticides. That may be because they are not fully aware of the harm of using them. Or maybe, as farmers, they have to get used to the use of them. As to the farmers' ability of planting on hillside without hurting the environment, answers of both groups appear diversified. That means people not quite sure about disadvantages of planting on hillside. This may constitute a major barrier of the implementation of reforestation project. If people think local farmers have the ability to gain both productivity and environment benefit on the hillside simultaneously, there would be no use of such a project. But, in general, Beijing's samples seem to be more worried about planting on hillside. As can be seen in Figure 8, more people take a non-positive attitude to it and nearly no person agrees the statement of Chinese farmers know how to grow crops on hillsides without harming the environment. What's interesting is that although nearly half people in our total samples take an above neutral attitude of growing plants on hillside, most of them still think it wise to plant trees or grass on the hillside (As is shown in Figure 9). This seemingly contradictory result reflects China's plight of arable land. Due to the lack of arable land, although people know planting trees or grasses on hillside

[3] Here the original data were adjusted to make it more close to the real situation. Most farmers said their annual incomes were just hundreds of RMB. This should not be the real case since the data of average annual income per provided by local government is much higher than it. So we think it is caused by the farmer's confusion between monthly income and annual income. So we time 12 to all the income data that seem to be too small. We have confirmed this adjustment with local statistic sector.

should be the first choice, they still insist on that growing crops on it is still acceptable. So it is not surprising that many people think farmers has the right of farming on hillside, as is shown in Figure 10. However, to this question, more rural people in Ningxia said no. One possible reason is that the rural people, who face their land be eroded day by day, could realize the serious erosion result of farming hillside more thoroughly. In this section, we also examine people's attitude toward government's responsibility of compensating farmers who lose their crop production due to the limitation of farming on hillside in the project of reforestation. The overwhelming majority say yes (See Figure 11). That is reasonable. After all, as the farmers living on hillside, the crop production on hillside is everything to them.

We also ask about the concept of sustainable development. Although most people say they know it, samples from Beijing could give a sound definition and samples from Ningxia could not. This contrast is really sharp. We assume that the term sustainable development is the most fundamental and popular word in today's environmental movement. Then associating it with the above discussion, we could generalize that rural people did not as fully recognize the danger of environmental hazard as the city people do. This may be a major barrier of persuading them take action against environment degradation.

Figure 12 to 16 examine the network between farmers and between urban residents and farmers, through close relatives, friends, and environmental organizations. It is found that the personal linkage to farmers in China is really close. As is shown in Figure 12 and 13, nearly most people, either in the city of Beijing or in the rural areas of Ningxia, have relatives and friends who are farmers. This could work as a significant network in mobilizing rural farmers. And it deserves the intentional enhancement. When promoting the reforestation policy, we should encourage the participants, either in city or rural areas, to disseminate the relative information to people around them. As to the environmental organization building, it is found that few people join any environmental organizations (Figure 14), but some of them do contribute to or volunteer in environmental causes (Figure 15 and 16). So it could be inferred that short-term participation plays a more significant role than long-term relationship in Chinese people's environmental movement. On one hand, we should take use of this finding and seek to grasp people' short-term notice of the environment awareness promotion. On the other hand, we also need to find the reason why the ratio of long-term engagement in environmental organization is so low and try to overcome this disadvantage. Special notice should be paid to Question 23 (Figure 15). It is

noticed that more people in Ningxia, who have less income and less awareness of the environmental problems, have make monetary contribution to environmental organizations then Beijing, which is out of our expectation. Further investigation was made to search for the reasons. According to the local teachers, local government and schools have arranged several activities to propagandize the environmental protection and some of them encouraged people make monetary contribution to environmental organizations. This should be a reasonable explanation of the high ratio of monetary contribution in Ningxia.

At the end of our survey, we also examine the effect of media and people's concern about environmental problems. The ways for people to get access to information about the environment are more diversified in Beijing than in Ningxia. As is shown in Figure 16, nearly all the listed media are used in Beijing and apparently each person has at least more than one way to expose himself to the environmental information. On the contrary, television is the only major way for people to get such kind of information. But it could be concluded that, in general, mass media is the dominating way to disseminate information about environment. The implications are apparent. Firstly, it would make sense if enhancing the mass media's role in mobilizing local people's passion for environmental movement. Second, the other information disseminating ways in China's rural areas should be enhanced. Thirdly, the government should consider promoting the information transmission among the relatives and friends' network since it is such a closely linked network as discussed above. For example, when inviting a person attend an environmental seminar, invite his families or friends together and when handing out environmental brochures, send extra copies for the person's families and friends together. However, such kind of work seems not being highly valued in reality. Few people report they could get environmental information from their friends or family members.

The last question of this survey is about the problems people free most concerned about. While most people take the environmental problems into the top five problems facing China, its importance raking differs slightly between Beijing and Ningxia. It seems that environmental problems are just one of the most serious issues for people in Beijing. But it takes the unarguably first position in Ningxia. It should be the real experience of environmental degradation that makes the rural people so serious about China's environmental problems. This could provide a sound psychology basis for mobilizing local people to take part in the reforestation project.

B. Implications and Policy Suggestion

Based on the description statistics results, we could link some of them and make further causality analysis. It is believed that this could be helpful in discovering the fundamental driving forces and barriers of mobilizing people for China's reforestation project. Generally, we conclude our findings from the following five aspects.

First, although rural people's worry about environmental problems mainly arises from their everyday experience of the water and soil erosion and has no solid knowledge basis. And the lack of knowledge is definitely related to farmer's lower education. In our survey, most people give a high seriousness ranking to environmental problems, but most of them could not fully realize the hazard of pesticides and fertilizers. Related to this is the low average education level among farmers. In such a case, farmers may think they should do something to improve environmental quality, but they may also have no idea about what should do. In order to make up such a deficiency, the government should provide specific measure for protecting environment to farmers and convince them that these measures would be effective. Besides, the government also needs to enhance environmental education in rural areas, including both increasing rural children's education years and shift the environmental education to an earlier education stage (It is reported that most rural people received primary and secondary education).

Second, it should be realized that it is still very hard to persuade farmers to give up planting crops on their hillside. While farmers know the best way to treat hillside is planting trees or grasses on it, they still insist on that they have skill to planting crops on it without hurting the environment. And they claim for compensation if they are banned to do so. This reflects farmers' inner need for this farming land. Besides, from an economic perspective, if the production of crop on the hillside is the only income resource of rural farmers, how could persuade them drop it. It is the base of their livelihood. So before the reforestation project could be carried out effectively, the government must find ways to cover the loss of stopping crop growing for farmers, either compensation or gaining from economic forest fostering. In addition, these ways must be sustainable. In fact, the sustainability of compensation is being the biggest problem frustrating China's reforestation project. Admittedly, many other mobilization methods increase the willingness of farmers to join this project and reduce the compensation amount they required. But we argue that the recovery of their crop loss is the baseline.

Third, we also find positive factors for mobilizing rural people in this survey. Rural people are equipped with the awareness of environmental problems, know the negative results of growing crops on hillside, and would like to devote time, money and energy in environment protection activities within their abilities. These factors should be magnified. As the people notice the seriousness of environmental problems, the government should tell them these problems are serious. As the farmers notice the hazard of planting crops on hillside, they government should provide a way to substitute crops on hillside with trees or grasses without hurting farmers' economic benefit. As the farmers are willing to try their best to contribute something to the environmental action, the local government should host such kind of activities more often and more variously. All in all, taking advantage of these factors is the key step in mobilizing local people in the reforestation project.

Fourth, media and relatives and friends networks are also important aspects in mobilizing people. Their significance and specific enhancing methods have discussed above. What should be pointed out here is the particular emphasis on television as a main propaganda way. Now the dominating majority farmers are receiving environmental information only through television. So the importance of enhancing environmental awareness promotion on television is indubitable. However, this media building does not get enough emphasis obviously. Farmers' environmental knowledge is still rare. They are not quite aware of the hazard of pesticides and fertilizers. And they even do not know about the concept of sustainable development. The government should do much more in strengthening the television's environmental information disseminating function. And we believe the government has the full ability to do that since it controls the operation of most major TV stations in China.

Fifth, the obvious shortcoming in China's environmental movements is the lack of various environmental organizations. That is also the reason why few people engage in long-term relationship in environmental activities. They have no organizations to take part in. In fact, nearly all the environmental protection movements in China are initiated, organized, and sponsored by the government. Non-government institutions play little role in it. But, it has been demonstrated that environmental NGOs are beneficiary complementary to government's environmental policies. Because they have more specific goals and can deal with specific problem more efficiently. So development non-government environmental institutions in China's rural areas should be taken into consideration.

Conclusion

In this paper, we examine the acceptance of the reforestation project among China's farmers from a brand new perspective, social movement mobilization. Although this is a government led program, it still needs support from grassroots farmers, as the social activists do. So mobilization theory could provide some improvement ideas for the further execution of this project.

We do survey with local farmers in Ningxia province who are participating in this project, as well as residents in Beijing as comparison group. Information of demography situation, environmental knowledge, media, network, financial resources, and environmental problem awareness are covered in out questionnaire.

Through the analysis of data collected in this survey, it could be concluded that many measures could be taken to mobilize local people, such as spread environmental knowledge, enhance environmental education, build environmental publicity through mass media, build non-government institution in the rural areas, and activate environmental information disseminating network among friends and relatives. Even so, there are still some barriers hard to overcome. The foremost one is economic compensation. It seems that the economic confliction between farmers and the government could only be alleviated and never eradicated. Besides, it requires really long time to cultivate ultimate environmental awareness. That means the real mobilization may be also a long term project. Before we complete that short term economic incentive is still indispensible.

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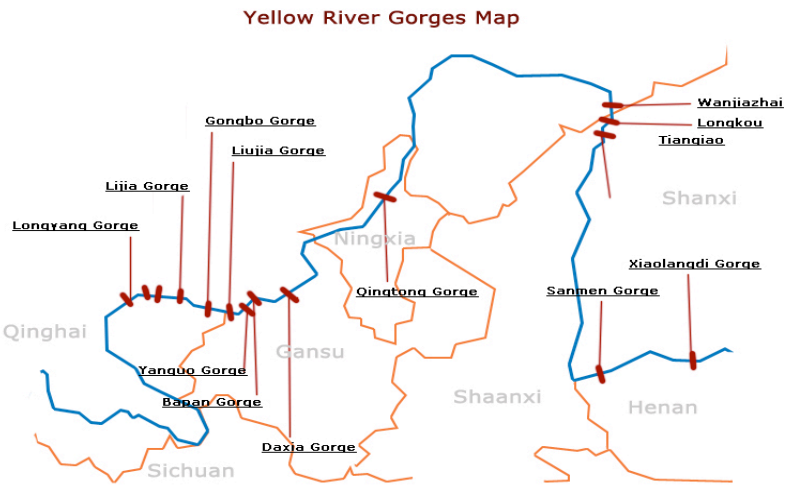
Appendix:

Figure 1



Internet resource

Figure 2: Family Size

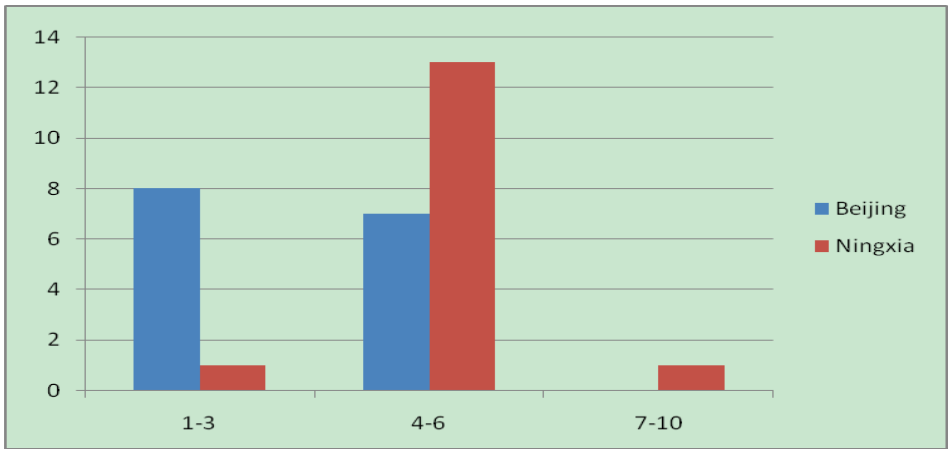


Figure 3: Work force

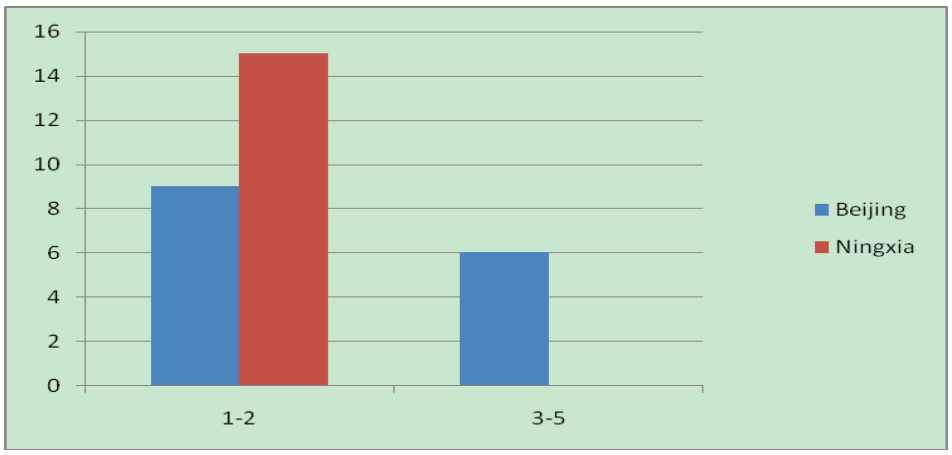


Figure 4: Children

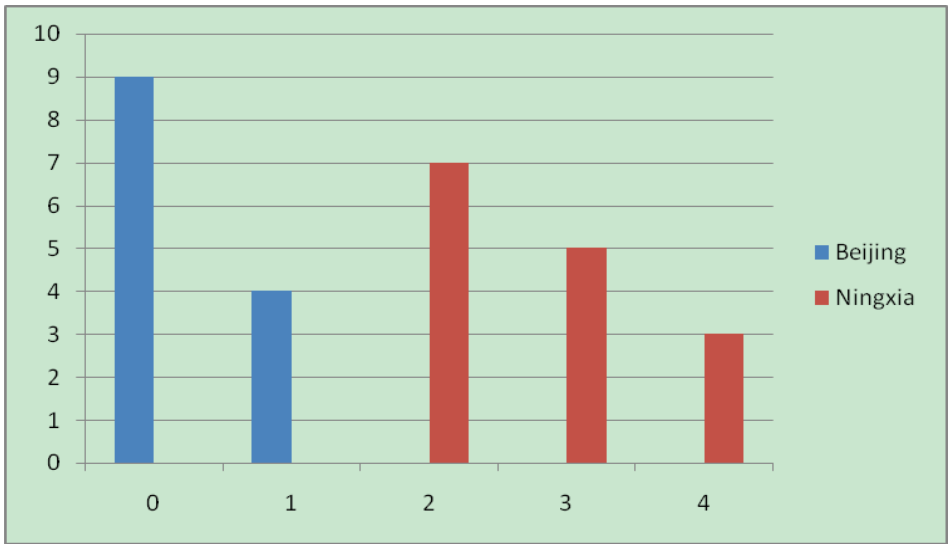


Figure 5: Education

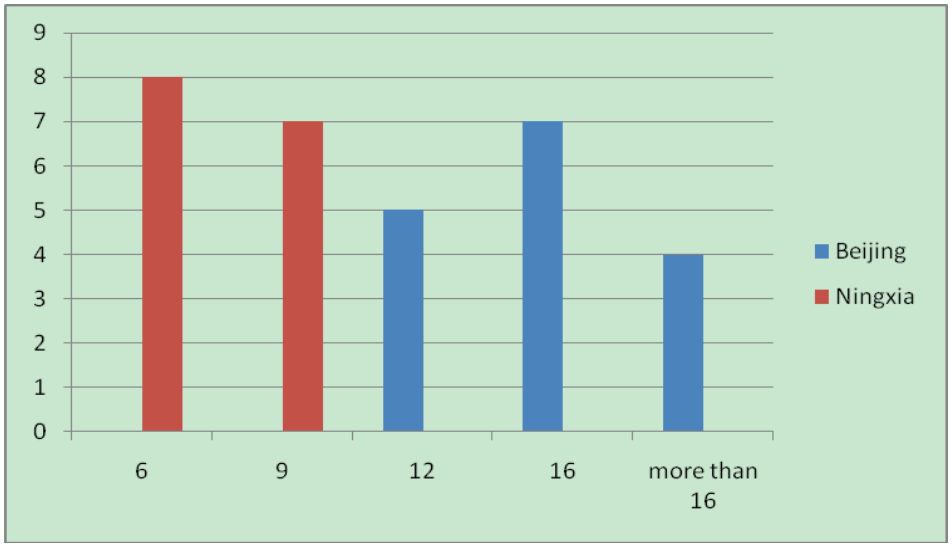
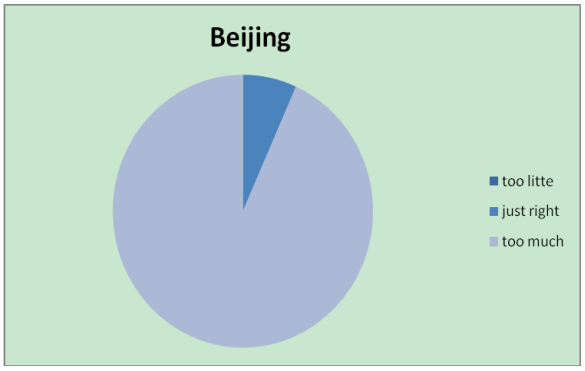


Figure 6: Attitude toward Fertilizers



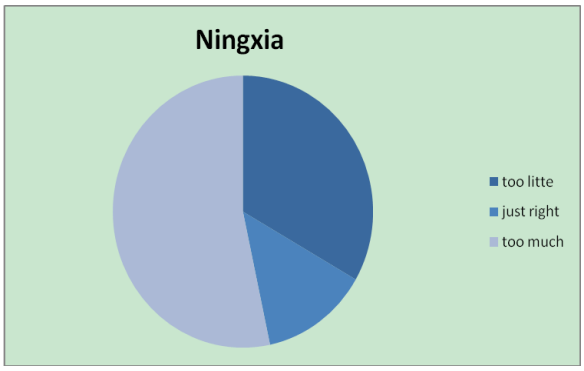


Figure 7: The pesticides being used in China are good for the environment?

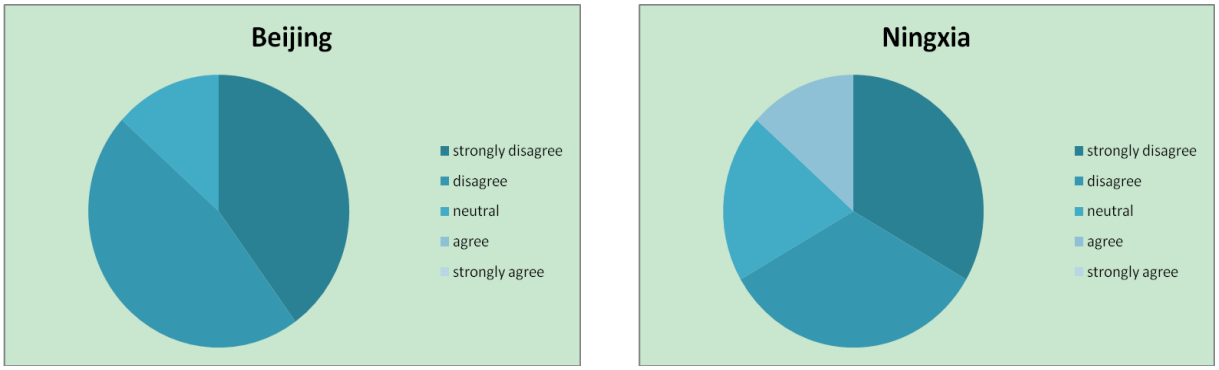


Figure 8: Chinese farmers know how to grow crops on hillsides without harming the environment?

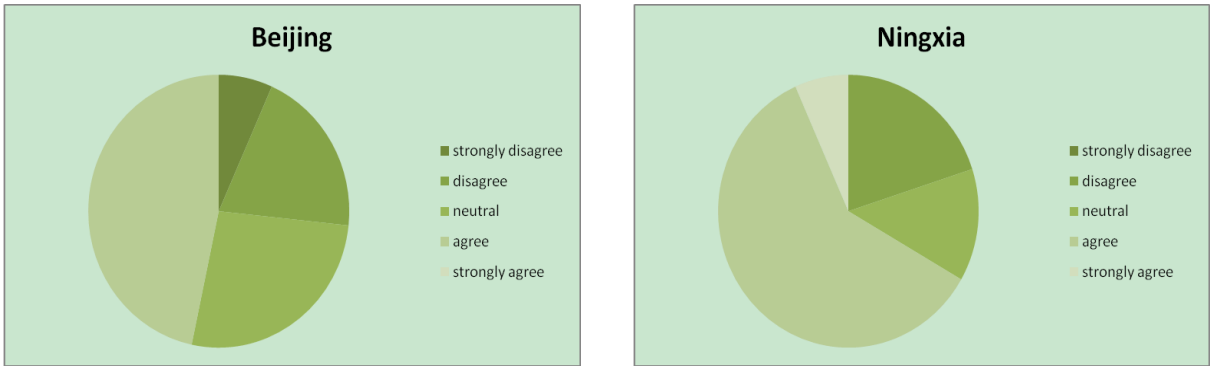


Figure 9: What is the best way to deal with hillsides

Figure 10: Should farmers in China be allowed to farm on steep hillsides?

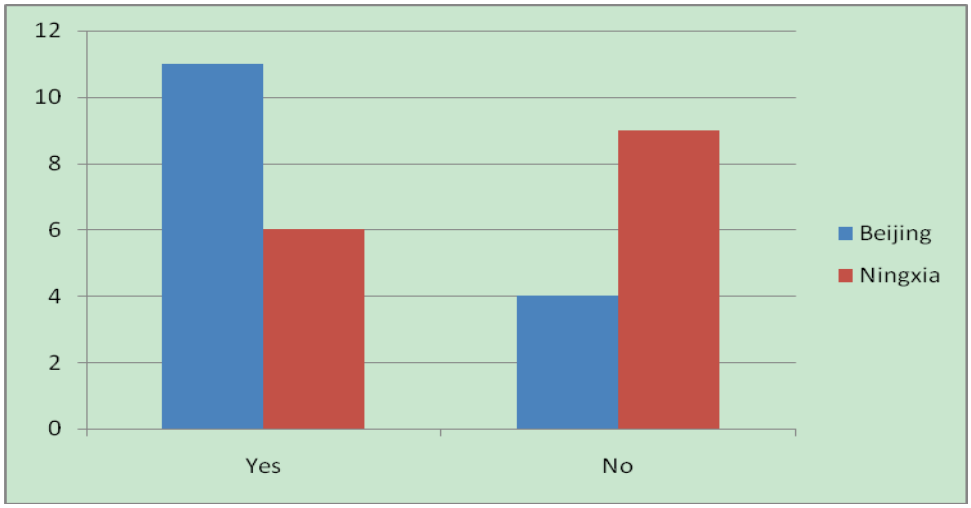


Figure 11: Should government compensate farmers if it orders farmers not to grow crops on hillsides?

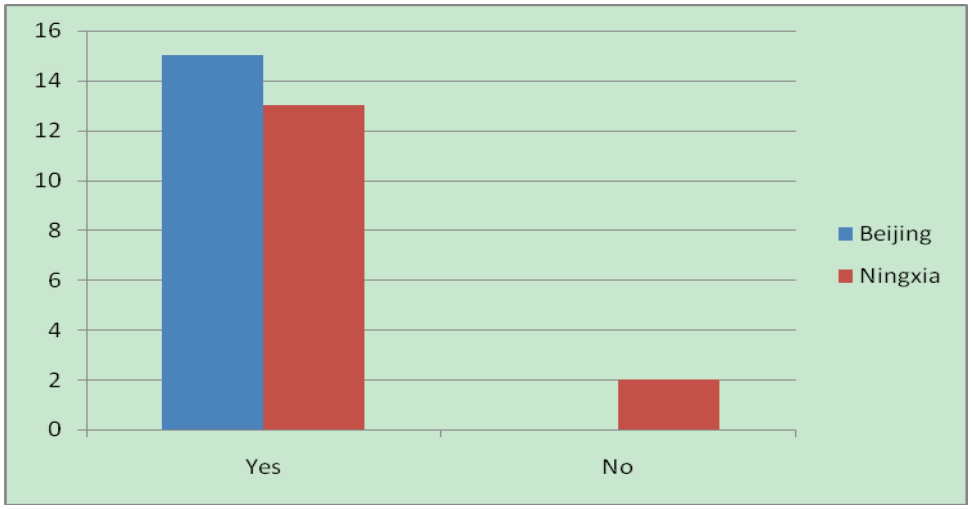


Figure 12: Do you have any close relative who is a farmer?

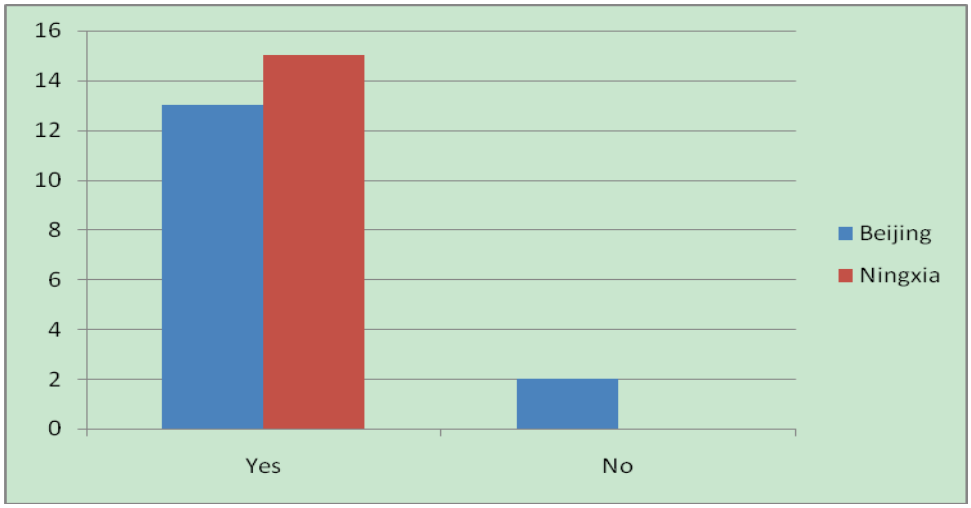


Figure 13: Do you have any friends who are farmers?

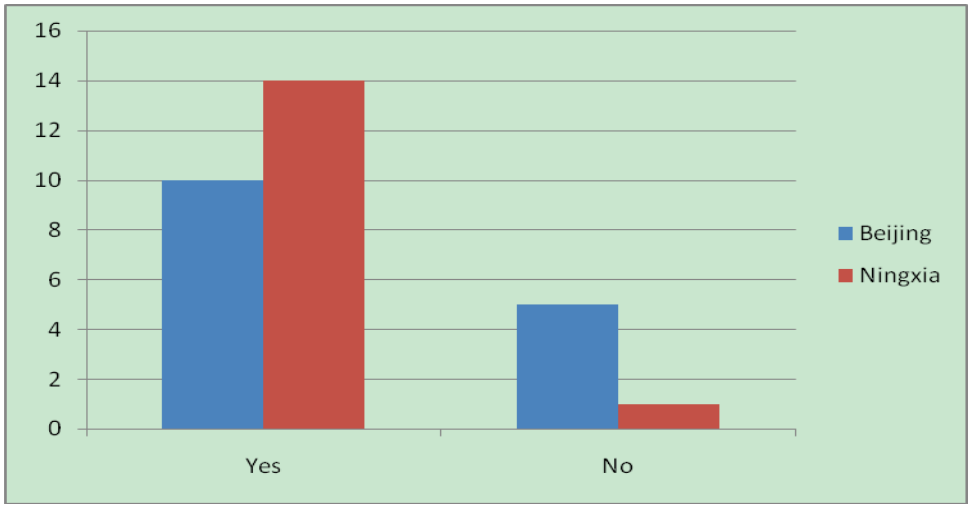


Figure 14: Do you belong to any environmental organizations?

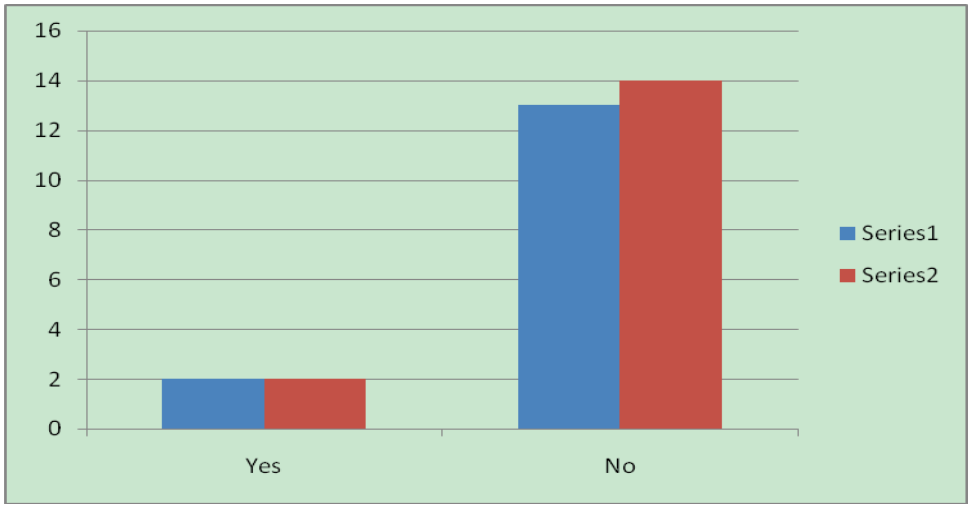


Figure 15: Have you made any monetary contributions to any environmental organizations?

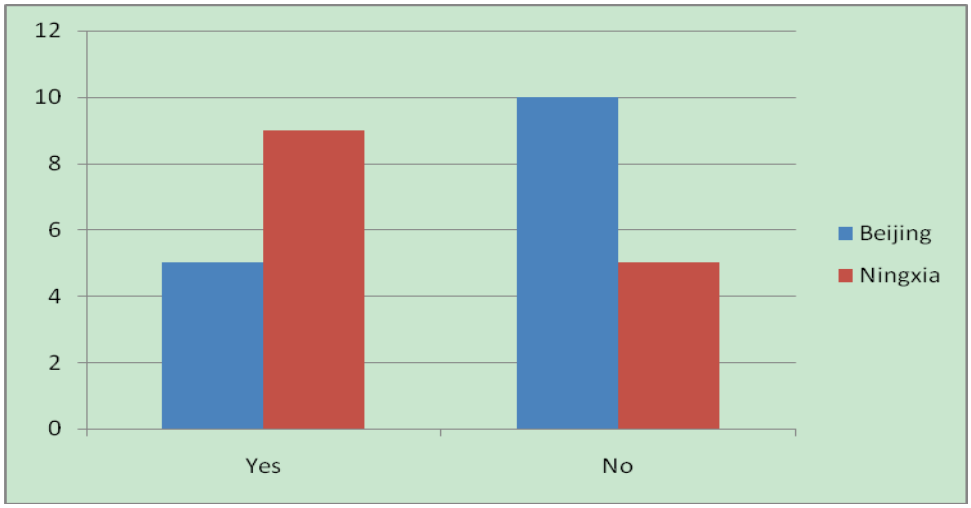


Figure 16: Have you volunteered for any environmental causes or organizations?

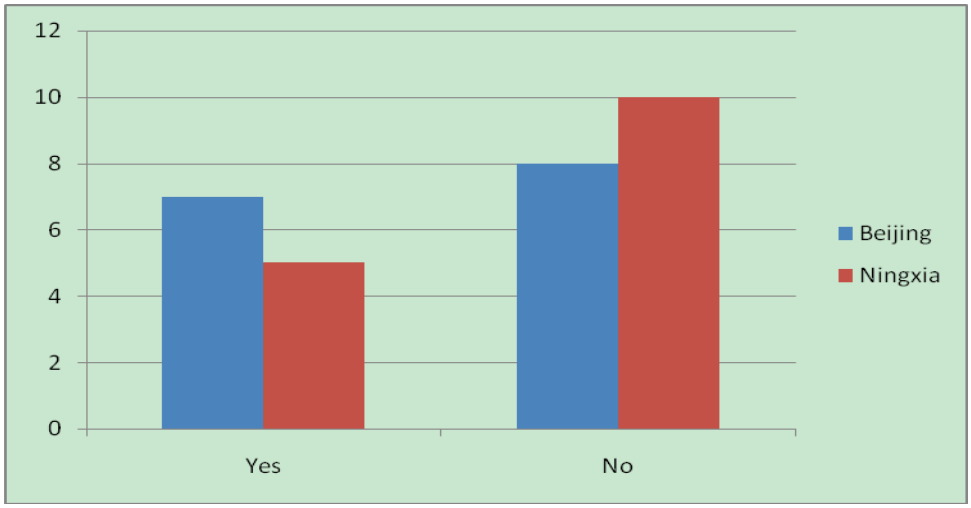
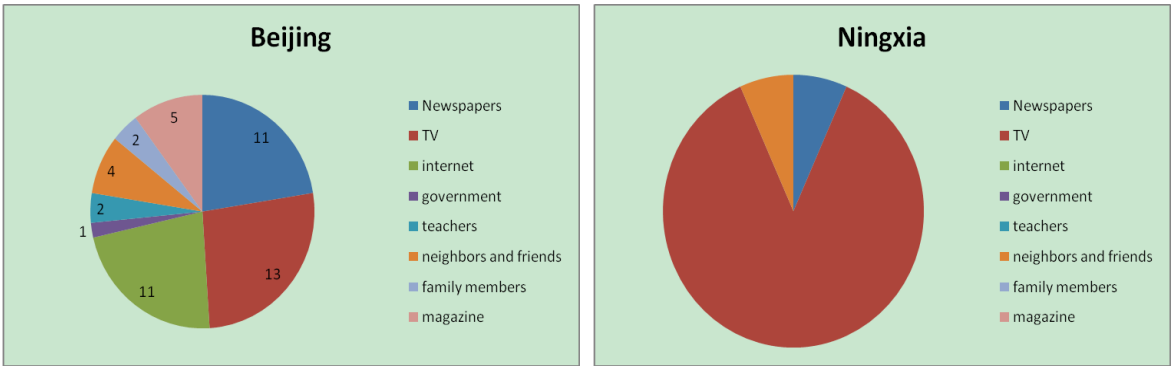


Figure 17 Environmental information disseminating ways



Note: all the data of Figure 2 to Figure 17 are calculated based on our survey