

Habit and Change: A Study on Farmers' Decision-making Behavior in the Evolution of Life Energy in Village D

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Abstract: *In order to promote the construction of rural living energy infrastructure, respond to the rural ecological environment construction in rural revitalization, realize the transformation of rural energy to clean type, and build a clean, low-carbon, safe and efficient energy system, the research adopts the method of field research, selects village D as the field spot, penetrates into the farmer's daily life field, and analyzes the formation and change of the farmer's decision-making behavior habit in the life energy evolution process, this paper studies the practical logic of farmers' decision-making behavior, and constructs the real picture of farmers' life energy use quantity, use structure and decision-making behavior, must understand the rural decision-making behavior in the habit formation and the change path.*

Keywords: *Habit; Change; Life energy; Farmers; Decision-making behavior*

1. Introduction

In our country, the research on energy has long been concentrated in the field of industrial production. In fact, with the development of social economy and the improvement of People's living standard, the proportion of energy consumption in ordinary residents' family life is increasing day by day. In the sixth population census in 2010, there were more than 700 million farmers. With the increasing level of urbanization in our country, although the number of farmers has decreased, the total amount is still very large. In 2017, there are still 577 million permanent residents in rural areas of our country, accounting for 41.5% of the total population. And in the process of rural revitalization, the disposable income of rural households and the demand for energy have increased, the realization of the modernization of rural life energy directly affects the realization of a well-off society in China, so it is of great significance to pay attention to the living energy use of rural households and their decision-making behavior. As the direct main body of life energy use, the study of farmer household's decision-making behavior in the life energy evolution process, on the one hand, it can build a more in-depth subjective picture of the amount and structure of rural household's use of life energy, on the other hand, it can provide reference for the construction of rural life energy infrastructure, at the same time, it provides reference for rural energy system construction to realize the transition from rural energy to clean, low-carbon, safe and efficient. The life energy in this study mainly refers to the direct life energy, mainly including cooking, heating, lighting, bathing and other energy use.

2. Literature review and question raising

Farmers' decision-making is influenced by many factors, which are made in the process of constantly weighing the pros and cons and comparing the length of the decision-making. In the process of life energy use evolution, farmers' decision-making behavior is also a process of constantly weighing and choosing. A study of the United States found a positive relationship between the age of the head of household and life energy consumption [1]. From the perspective of household size, the smaller household size leads to the weakening of the economies of scale effect of energy consumption, which results in the increase of per capita energy consumption, most studies at home and abroad have verified this theoretical hypothesis [1],[2],[3],[4]. The more educated family members are, the more likely they are to adopt new energy sources, and the more conscious they are of energy conservation [5], both population ageing and household miniaturization have significant positive impacts on per capita energy consumption [6]. Although the increased demand for economic development has been replaced by commercialized energy

sources, because farmers are accustomed to using local materials, the convenience of access to traditional non-commodity energy thus continues to make such energy a major source of energy for farmers' livelihoods [7]. In a word, the behavior of peasant households in the process of life energy evolution is restricted by many factors, such as natural factors such as resource endowment, geographical environment, income, family endowment and social factors.

As of 2010, more than three-quarters of rural households in China still live in rural areas, approximately 490 million rural residents still use fixed fuels as the primary source of energy for cooking [8], whereas the use of solid fuels as the primary source of energy for cooking increases health risks for rural residents; Economic income is inversely related to this health risk [9], poor and low-income rural residents face higher health risks due to increased use of solid fuels due to affordability constraints [10]. In order to analyze the decision-making behavior of farmers, it is not enough to analyze only from the aspects of influencing factors and final results. The behavior logic of the peasants can be understood only when it is placed in the specific field of the rural community. When discussing the behavior logic of the peasants without the specific field of social life, they will often fall into the mire of value judgment [11]. The small farmer's behavior is rational, and this rationality has certain limitations, on the one hand by external conditions, on the other hand by their own cognitive constraints [12]. Binary Logistic model was constructed to explore the influence mechanism of individual and family characteristics, external environmental factors and the cognition of returning farmland welfare on farmers' returning farmland decision-making [13].

To sum up, most of the current studies use quantitative research methods to analyze the existing data through various macro-models and econometric models [14],[15], such as Logit, Tobit model, analytic hierarchy process and so on, the research content mainly revolves around whether to use energy, how much to use, energy use proportion, consumption structure of farmers, quantity and its influencing factors and so on. However, there is a lack of qualitative and in-depth research, and the micro-level farmers in the life energy evolution of the decision-making behavior less attention, especially the lack of decision-making behavior of farmers mechanism analysis. In this paper, we selected Village D in Weifang, Shandong Province, as a field site to study the decision-making behavior of farmers during the evolution of living energy, and to analyze the formation of decision-making habits, the turning point of decision-making behavior change and its practical logic of decision-making behavior. In order to optimize the structure of rural life energy use to improve the situation of rural life energy use reference, from the micro-point of view to explore the decision-making behavior of farmers, thus, it can effectively guide farmers' decision-making behavior in life energy and promote the optimization and upgrading of energy structure. And to the rural environment improvement and the realization rural revitalization strategy has the certain practical significance.

3. Results

Village D is part of the Xiashan eco-economic development zone in Weifang City, Shandong province. It is located on the west bank of the largest reservoir in Shandong province, Xiashan Reservoir, corn, soybeans and other Cash crop, mainly ginger, peanuts, potatoes and so on, since 2000, has vigorously developed freshwater fish farming, planting trees, but since 2017, the collective began recycling fishponds, banned fish farming. The per capita arable land area less than one mu, the village is a traditional agricultural village, there is no industry, is the reservoir resettlement village, most of the arable land is waterlogged land, income is not fixed. With the development of urbanization, a large number of rural people go out to work, there are 413 villages, a total of 2,065 people, of which 1,037 permanent residents, most of the permanent population age 50 years old or older.

Village D has long relied on biomass (straw and firewood) as its main source of energy. Coal is used more for heating in winter, and kerosene lamps and candles are used for lighting before electricity is turned on, then electricity as a new cooking energy appeared in people's daily life, in the 1990s liquefied gas as a new cooking energy appeared in the village, solar energy is the main use of bathing. As of 2020, the village has not appeared on the use of methane farmers. In a word, the evolution process of life energy in village D follows the path from single life energy to combined life energy In terms of the quantity of energy used for living, it has evolved from one kind of energy to many kinds of energy. In terms of the structure of energy used for living, the proportion of traditional non-commodity energy has gradually decreased while that of commodity energy has increased, but traditional non-commercial energy still accounts for a large proportion; the proportion of non-clean and quasi-clean energy is much higher than that of clean energy. Such a transition path is not one-way, the only, at present the village's living energy is mainly a combination of several energy sources, including bio-energy (straw, firewood), coal, liquefied gas, electricity. The change of energy consumption structure in China is mainly represented by the substitution of oil, natural gas and electricity for coal and the transition from primary to clean use of coal [16].

According to Giddens, intentional actions can have unintended consequences, and farmers' decision-making in the use of energy contributes to village D's energy situation, this, in turn, constitutes an unrecognized condition for farmers' next actions. Therefore, the study of farmers' decision-making behavior in this process is of great significance for a comprehensive understanding of the living energy situation in village D, and can effectively guide the optimization and upgrading of energy structure to improve the rural ecological environment.

4. Discussions

4.1 Formation of Habits

According to Pierre Bourdieu, habit formation is a profound and far-reaching change in the self that the mind achieves through special, long and systematic indoctrination, and based on a set of self-consistent and comprehensive principles. According to habit formation theory, the purchase behavior of customers is actually a process of establishing and maintaining habits. In the decision-making process of energy use, farmers also follow certain habit formation theories. In particular, in the current population ageing process, most of the people who remain in the rural areas are middle-aged and elderly. Among the permanent residents of Village D, 80% of them are over 45 years old, 65% of them are over 50 years old, which means that the majority of the residents are middle-aged and old people over 50-60 years old, and the habits of these people have been formed. Because of the large inertia of energy consumption in China, once the habit of energy consumption is formed, it will last for a long time [17].

Before the 1980s, village D mainly grew crops, including wheat, corn and soybeans, whose straw was widely used for cooking as a source of energy, another source of energy widely used for cooking is fuelwood, which comes mainly from the straw or dry wood of these creatures, which is extremely easy to obtain in the village and does not need to be purchased. In a long time before this period, straw and firewood become the life energy that people can get at hand, also become the inevitable choice in the life energy choice process, or is a kind of habit behavior. And people have been using it for generations. When people are asked why they choose to use straw and dry wood to boil water for cooking, some people answer that they have always used these things, aren't they mainly used in the countryside, some older people are even more puzzled by the problem, and don't think there is an alternative. After entering the 21st century, especially since the construction of the new countryside, the government has paid more and more attention to the rural environment, and the rural revitalization strategy has even proposed the construction of rural ecological civilization, forbidding the piling up of firewood and straw in the villages, some farmers, especially the elderly, pile up firewood and straw in their yards so that they can continue to use it.

The main role of coal in village D is to keep warm in winter. The structures of the houses in the village are usually equipped with winter heating facilities, and the energy used by such facilities is coal. There is no alternative energy use, farmers store a certain amount of coal in winter. Among the farmers who do not have such facilities, straw, firewood or electrical appliances will be used for heating. With the increase of farmers' income, most of them will choose coal for heating in winter, this way of heating is more economical than electricity. As spring turns to winter, coal becomes the farmers' first choice for winter.

In the 1980s, electricity became an important source of life, but at this time in village D, electricity was only used for lighting, and the voltage was not very stable, and at peak times, frequent blackouts, as a cooking energy use, electricity in this period has not been widely recognized. Since the 1990s, the stability of electric energy has greatly improved, and people's living standards have gradually improved. At present, electric energy has taken a place in the living energy of Village D, in the lighting, boiling water, heating, cooking, bathing and other daily life in a certain proportion. It is especially popular with young people. Although the proportion of young people in the permanent population of Village D is not high, the survey found that these young people tend to use electricity and liquefied gas as the main source of cooking energy, when asked what kind of energy they use for cooking, they invariably answer that electricity and liquefied petroleum gas are more resistant to the use of straw and firewood. Moreover, in their housing structure, there are very few facilities for burning straw and firewood. They believe that electrical appliances and gas stoves are clean, convenient and fast, and that economic factors are not taken into account, consider it a necessary daily expense.

It can be seen that the decision-making behavior of rural households is a kind of habit to some extent in the process of rural life energy use, and this kind of decision-making behavior habituation is affected by the age, the housing structure, the resources availability, the stability as well as the economic factor, once the life energy decision-making behavior habituation formation, then the habit will be maintained for a certain period of time. While there is much more to be said for new energy, there are habits of decision-making that cannot be changed overnight.

4.2 Change of Habit

Habit, Pierre Bourdieu argues, is a permanent, transferable system of temperament. In the process of life energy evolution, farmers' decision-making behavior will have some stability once it is formed, but in the process of interview, it is found that farmers' decision-making behavior is not immutable, they are also willing to change their decision-making behavior at a particular time or situation.

Income is still an important factor affecting the transition of rural households to clean, high-quality energy [18], so the use of coal, electricity, liquefied petroleum gas, solar energy in the home is much higher than the use of straw and firewood. With the increase of income level, the number of household electrical appliances is increasing. "We didn't have any appliances in the 1980s. We bought a black-and-white TV in 1996. Our children were in school. We didn't have a good financial situation. It wasn't until the 21st century that we started to buy all kinds of appliances at home. By that time, our children were working and our family's financial situation began to improve. In the 1980s, the whole village used wood for cooking. At that time, there was no extra money to buy electrical appliances and liquefied gas. Later, when people's economic situation improved, they had more choices. In the average family, they would use several kinds of energy together, not just one" (Case 2, L XK, age 62). "If we want to use electricity to cook, we need to buy all kinds of household appliances, such as rice cookers, induction cookers, electric kettles and so on. We elderly people don't have more money to buy these things. Besides, we are used to burning wood to cook, and also save money." (case 4, WBL, age 68) "When my family used to farm a lot, they used gas stoves. At that time, they were busy and tired. They didn't have time to burn wood for cooking. Using gas stoves was faster and saved time and effort. Now we are older, usually nothing, now cooking is mainly firewood" (case 1, DQW, age 65)." Therefore, it can be seen that with the increasing income of farmers, they will change their previous life energy decision-making behavior and choose cleaner energy to achieve optimization and upgrading of life energy. But this kind of behavior of farmers sometimes because of the change of the objective environment and the passage of time and a certain degree of reverse decision-making behavior.

Under certain circumstances, farmers' decision-making behavior will change in the process of life energy evolution. "Usually, when we are the only old couple in the house, we cook with straw and firewood. After all, we have nothing to do. We Don't mind the trouble and don't mind being dirty. When the children came home, they used liquefied gas or rice cookers. They were no longer used to straw and firewood in the city and did not want us to use them. They bought US appliances and installed gas stoves" (case 3, LYJ, age 65). With the development of modern technology and information technology, young people have more and more resources, and their status in the society is higher and higher, in the family unit this situation is gradually reflected, so that many times the elderly may be because of emotional, status, many times active or passive tolerance or transfer of power, there is a difference in decision-making behavior when the child is not at home.

"It doesn't matter if you eat chaff or vegetables, you can save straw and firewood for cooking, but during the holidays, when you have guests at home, you have to show the best side of your home. This is a sign of respect for people and basic etiquette" (Case 3, LYJ, age 65). In rural society, face is a very special existence, which plays an irreplaceable role in maintaining the normal social order in rural areas.

"We haven't been farming at home for a long time. After we got married, we started a small business. Now, we mainly stay at home to look after our daughter's children. The old man drives the people in the village to work. Our home is now mainly using liquefied gas and electricity, because there is no land and no straw can be used, the village in the 1980s basically use straw, firewood, because there is no other things can be used, and then used for a period of time the briquette stove, at that time the electricity is not easy to use, often the phenomenon of power cuts, even if there are electrical appliances cannot be used, if the power is not cut we can also choose to use electricity to cook, this is more convenient and clean. It is said that some villages use biogas, but we don't have it here, and no one has installed it. There is no such facility in the village, so we can't use it even if we want to. There are now many places have solar PV, but the initial investment is too high, the general people do not need. (Case 5, LYL, age 53) "The deployment of rural public infrastructure and the high cost of new energy technologies also change the decision-making behavior of farmers in the process of energy evolution to a certain extent, discourage farmers from using clean energy.

5. Conclusions

In general, in social science research, it is only by going directly into a situation and observing the actions that take place in that situation that the meaning of people's actions can be truly understood (Dunkin, 2004). Pierre Bourdieu argues that practice is caused by the individual's nature (habits) and his position in the field (capital), under the current rules of the game in a social place (field). The formation

and change of farmers' decision-making behavior habit in the process of life energy evolution are inseparable from their daily life field. Habit is a kind of generative schema that is objectively adjusted according to the specific situation of the environment in which it is formed. First of all, habit is structured by a person's past and present circumstances, because it is objectively adjusted to the specific circumstances in which it was formed. Second, habits are structural because a person's habits are involved in shaping a person's present and future practices, that is, they are generative (i.e., generating ideas, understanding, and practices). Third, habit is a structure because it is a systematic order, not random or unorganized. Therefore, this structure constitutes a set of fixed system of generating ideas, understanding and practice. Habits are the integration of the mind and the body so that they can be harmoniously adapted to specific areas or transcend them. Therefore, in the process of promoting new energy, we should consider the attraction of energy itself to farmers, and also pay attention to the subjective and objective factors of farmers' energy decision-making behavior, such as individual endowment, family endowment, position in the field and the possession of social capital.

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