

# Research on Farmers' Satisfaction Evaluation for Crop Variety Subsidy Policy

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**Abstract:** In this paper, for improving the effect of crop seed subsidy policy in China, an empirical analysis of the satisfaction evaluation of peasant households was conducted by referring to the results and evaluation methods of the satisfaction theoretical research, and by utilizing the investigation data of 353 peasant households in northern Anhui Province. The results indicated that the overall level of satisfaction of the peasant households in regards to the improved variety subsidy policy was not high, the comprehensive score found to be only 55.38. The satisfaction of the peasant households in regards to the output of the varieties subsidized, the subsidizing methods of the improved varieties, and the selling prices of seeds was also studied. The subsidy amounts were relatively high, while the satisfaction was evaluated in terms of the popularization of the supporting technologies, the business ability of the agricultural technicians, and the working altitude. It was regarded in this study that improving the subsidy amount of the improved varieties, promoting agricultural technical popularization system reform, and perfecting agricultural technician motivation mechanism were the key factors for improving the current overall satisfaction of the present improved variety subsidy policy.

**Keywords:** Improved variety subsidy policy, peasant households, satisfaction evaluation, sensitivity.

## 1. INTRODUCTION

The improved variety subsidy is a supporting policy issued by the state in order to encourage peasants to select high-quality crop varieties. Also, it is an important approach for accelerating the extension of the improved varieties, promoting the increase of agricultural production, and increasing the income of the peasants. It is of great significance for the improvement quality of crops, realizing scale-up planting, standardizing the management and industrialized operations, and ensuring the grain safety of the state. China began to organize the implementation of the improved variety subsidy projects in 2002. First of all, the state arranged for RMB 100 million to support the soybean planting in the three provinces of northeastern China and Inner Mongolia Autonomous Region. In 2004, the scope of the improved variety subsidiary was expanded to the four grain crops of wheat, corn, rice, and soybean. In 2009, the improved variety subsidy was fully expanded to include rice, wheat, corn, and cotton. In 2011, the improved variety subsidy state amount was increased to RMB 20.2 billion. In 2012, the No. 1 Document of the Central Government emphasized the increased efforts to improve the variety subsidy once again. With continued social and economic development, the scale of the improved variety subsidy will need to be further expanded [1]. Questions still remain regarding what have been the effects of the improved variety subsidy policy, and what are the influencing factors. Such questions

are all topics of intense concern for both government organizations and researchers.

Many research teams have studied the effects of the improved variety subsidy policy in China. Zhao, Cao, Xie *et al.* (2011) concluded that the implementation of the improved variety subsidy policy significantly improved the per unit area yield of rice, and also played an important role in guaranteeing the grain safety of the state through investigations in Jinshan District, Shanghai [2]. Li, Li and Feng (2014) analyzed the investigation data of 1,486 peasant households in the main oilseed rape production area of China, and conducted an empirical analysis of the effects of the improved variety subsidy from four dimensions: increase of output, increase of income, increase of efficiency, and technological popularization. The results indicated that the improved variety subsidy policy and subsidy amount could significantly improve the production efficiency of oilseed rape [3]. Peng and Meng (2013) utilized the statistical data gathered from Hua County, Henan Province, to analyze the influence of the improved variety subsidy on the increase of income for the peasant households, and also for improved grain production. The results indicated that the effects of the current improved variety subsidy policy were not significant, despite certain effects regarding the increase of income. Its effect on the increase of the output of grains was relatively significant. However, the effects were not fully in play clearly shown [4]. Wang and Xiao (2007) utilized the investigation data of 340 peasant households in Hebei Province, Henan Province and Shandong Province, to conduct a quantitative evaluation of the performance of the improved variety subsidy policy. They concluded that the influence of the improved variety subsidy on the grain output was insignificant with the current

condition of the subsidy standard being relatively low [5]. Guan and Tan (2014) analyzed the effects of the improved variety subsidy for cotton by utilizing a relevant economic model. The results indicated that the effects of the improved cotton variety subsidy policy currently implemented in China with regards to improving the production efficiency of cotton was limited. It was recommended to the government to take the per unit area yield as the basis for the subsidy, and to increase the technological input for the improvement of the production technologies [6].

We can see from sorting the relevant research data that the current evaluations of the effects of the improved variety subsidy policy have mainly considered aspects such as the production output and income increases, while research studies regarding subjective evaluations from the perspective of the peasant households are seldom seen. Since peasant households are the beneficiaries of the improved variety subsidy policy, the evaluation of their satisfaction is not only an important index for measuring the effects of the improved variety subsidy policy, but also an important basis to further perfect the improved variety subsidy policy. Therefore, the study of the satisfaction of the improved variety subsidy policy by the peasant households is of great realistic significance. Since Anhui Province is a major agricultural area, as well as a main wheat producing region, it plays an important role in guaranteeing the grain safety of the state. Therefore, the analysis of the effects of the improved variety subsidy policy on the wheat growers in Anhui Province presents a very important representativeness.

## 2. QUESTIONNAIRE DESIGN, DATA SOURCE AND SAMPLE ANALYSIS

### 2.1. Description of Questionnaire Design

A customer satisfaction model has been increasingly applied to the evaluation of government work performance. The peasant households are the service objects of the improved variety subsidy policy, and they comply with the main characteristics of customers in the customer satisfaction index model. Therefore, a peasant household satisfaction index system was built in this study, based on specific conditions of the improved variety subsidy, and also by referring to the American customer satisfaction index model. This index system was comprised of the three latent variables of: the variety quality, agricultural technician service, and improved variety subsidy policy; and of one manifest variable, which was the publicity effect. The definition of each latent variable, along with the description of the corresponding measuring variables are as follows:

(1) Variety quality: Based on the investigation, the peasant households attach great importance to the following factors concerning wheat variety: the output, resistance, and selling price of the wheat seed. Therefore, in this study the evaluation of the quality of the wheat subsidy variety through the perception of the peasant households for three attributes of variety was analyzed.

(2) Agricultural technician service: The satisfaction evaluation of the peasant households for the agricultural technological popularization personnel mainly included the following four aspects: contents of the agricultural techni-

cian service, business level, contact frequency, and service level.

(3) Improved variety subsidy policy factor: The evaluation of the improved variety subsidy policy factor mainly included the subsidy amount, and the issuing method.

A common Likert method was adopted in this study to investigate satisfaction of the peasant households. The evaluation of the peasant households for each item was classified into five grades as follows: very satisfied, satisfied, acceptable, dissatisfied, and very dissatisfied, and these grades were assigned as 5, 4, 3, 2, and 1 according to different degrees, which would correspond to the values of 100, 80, 60, 40, and 20 in a hundred-mark system.

### 2.2. Data Source

Anhui is a major grain producing province and the main wheat producing region. The province crosses the two major wheat producing regions of the Huanghuai Plain, and the middle and lower Yangtze Valley Plain. The investigation locations in this study included the four wheat producing counties (regions) in northern Anhui Province (Yongqiao District, Xiao County, Suixi County, and Lieshan District). The wheat production conditions of the growers were investigated by random sampling. This investigation was conducted by utilizing a favorable opportunity when local students were on vacation, and had returned home. In order to ensure investigation quality, the students involved in the investigation were trained in advance, and the number of investigation tasks assigned to each student did not exceed five. There were 650 questionnaires distributed at this time. The returned effective questionnaires were 581, making the effective rate 89.38%. Since this study mainly surveyed the evaluation of the satisfaction for the subsidy varieties, the data adopted in this study was the data of the 353 wheat subsidy variety users in this investigation. The peasant households not adopting the subsidy varieties were not involved in the following calculations.

### 2.3. Reliability and Validity Check of the Questionnaire

The reliability is an index of a measurement tool which reflects the reliability, consistency, recurrence and stability degree of the measured object. A Chronbacha  $\alpha$  coefficient was adopted as the check standard during the reliability check in this study. Statistical software SPSS17.0 was utilized to obtain the Chronbacha  $\alpha$  coefficient as 0.818. It could be determined that the questionnaire of the satisfaction evaluation of the peasant households for the improved variety subsidy policy was of a relatively high reliability.

The validity refers to the degree of a measurement tool reflecting the essential attributes of the measurement. The value of the KMO (Kaiser-Meyer-Olkin) was 0.811, while the Chi-square statistical value of the Bartlett test of sphericity was 148.5. The concomitant probability was 0.000, which was less than the significance level of 1%, which indicated that this question had favorable structural validity.

### 2.4. Basic Conditions of Peasant Household Samples

The peasant households sampled indicated that the number of male heads of households comprised 91.39% of the

total number of heads of household, showing a very stable position of males in the production decision-making. If viewed from the perspective of age, the age of the heads of households was usually relatively high, with an average age of 51.96. The number of heads of households below 40 years of age only made up 12.3%, while the number of heads of household with ages above 50 years of age reached 50.85%. The age of some heads of household even reached 75 and above. If viewed from the perspective of education, the number of peasant household sampled with an education background of middle or primary school and below accounted for 19.93%; those with an education background of junior high school accounted for 62.2%; and those households with an education background of high school and above only accounted for 27.61%. The land scale of the peasant households was relatively small, and the average land area of the peasant households sampled was 0.59 hectare. Each portion of land only covered an average area of 0.069 hectare. The conditions of the peasant households sampled were relatively consistent with the relevant research data, which indicated that the investigation data in this study were relatively reliable.

### 2.5. Satisfaction of Peasant Households Sampled for Each Component of Improved Variety Subsidy Policy

The descriptive statistics indicated that the satisfaction of the peasant households, in regards to the variety output, publicity effect, subsidy method and subsidy amount, was found to be relatively high, and ranked in the first four places. Meanwhile, the satisfaction of the peasant households for such items as the contact frequency of the agricultural technicians, variety resistance and popularization contents was found to be relatively low.

## 3. MEASUREMENT OF SATISFACTION OF PEASANT HOUSEHOLDS FOR IMPROVED VARIETY SUBSIDY POLICY

### 3.1. Measurement Formula

The satisfaction evaluation of the peasant households for the improved variety subsidy policy was a latent variable, which shall be indicated through a relevant manifest variable. A weighted average method was usually adopted to calculate the satisfaction with the formula as follows:

$$CSI = \sum_{i=1}^n W_i X_i \quad (1)$$

The CSI indicates the index of the satisfaction of the peasant households for the improved variety subsidy policy;  $W_i$  indicates the weight of the  $i$ th index; and  $X_i$  indicates the satisfaction evaluation of the peasant households sampled for the  $i$ th index. This value is the average of the satisfaction evaluation of the peasant households sampled for this index. The index weight  $W_i$  has a relatively significant influence on the calculation result of the satisfaction degree. Assigning the weight to each index is a key content for the calculation of the overall satisfaction. Currently, the common methods used for the determination of the weight include AHP, subjective assignment, objective assignment, Delphi, factor analysis, correlation analysis, and so on. The factor analysis

method was applied in this study to determine the weight of each index.

### 3.2. Satisfaction Calculation Results

The weight of each variable in the satisfaction was obtained by utilizing a factor analysis method. The average level of satisfaction of the peasant households for the improved variety subsidy policy could be measured according to the satisfaction measuring formula. The overall satisfaction evaluation of the peasant households was 2.796, converted to 55.38 in terms of a percentage amount, which indicated that the evaluation of the peasant households for the current subsidy variety promotion program was relatively low. If viewed from the aspect of individual projects, the peasant households' evaluation of the variety output, variety expectation, improved variety subsidy method, selling price of wheat seeds, and subsidy amount, exceeded the average of the evaluation of the peasant households. Meanwhile, from the aspect of the popularization contents, the popularization level of the agricultural technician, contact frequency, and popularization level was lower than the average level. we can get the satisfaction index and weight of peasant households in Table 1.

## 4. SENSITIVITY ANALYSIS OF ANALYSIS OF SATISFACTION OF PEASANT HOUSEHOLDS FOR IMPROVED VARIETY SUBSIDY POLICY

The four-quadrant diagram model, also known as the important factor deduction model, is a diagnosis model designed for qualitative study. This diagram can directly reflect the satisfaction evaluation of the peasant households for the various indexes, as well as the degree of sensitivity to general satisfaction. As shown in Fig. (1), the significance is expressed by the weight of each index in the calculation of the overall satisfaction, and the indexes used for the satisfaction evaluation are indicated by the average of the satisfaction evaluation of the peasant households. The diagram is divided into four quadrants by using two mutually vertical reference lines, and the intersection of these two reference lines indicates the satisfaction average and significance, with the coordinates of (0.101, 2.719). Each evaluation index is distributed in these four quadrants, according to the satisfaction and significance data, which is specifically analyzed as follows:

The first quadrant is the opportunity area. The dots distributed in this quadrant indicate the items with relatively lower significance, and also having relatively low satisfaction results from the peasant households at the present time. Due to the lack of resources, the items in this area can be properly loosened. The contact frequency of the agricultural technician is distributed in this area, indicating that peasant households paid more attention to the actual effects of the popularization work, instead of only the popularization form. The work assessment of the agricultural technology popularization personnel should therefore not be just based on the number of times the countryside was visited. The second quadrant is the repair area. The dots distributed in this quadrant indicate the items with a relatively high significance, but also having relatively low satisfaction results from the peasant households at the present time. Such items shall repaired

Table 1. The satisfaction index and weight of peasant households [7].

Variable	Satisfaction	Weight	Satisfaction × Weight
Publicity effect	3.2	0.114	0.365
Resistance	2.46	0.119	0.293
Output	3.25	0.105	0.341
Popularization content	2.5	0.115	0.288
Popularization level	2.59	0.137	0.355
Contact frequency	2.2	0.096	0.211
Service attitude	2.59	0.132	0.342
Subsidy method	3.13	0.057	0.178
Selling price of variety	2.8	0.113	0.316
Subsidy amount	2.97	0.025	0.074
Total satisfaction index	2.755		

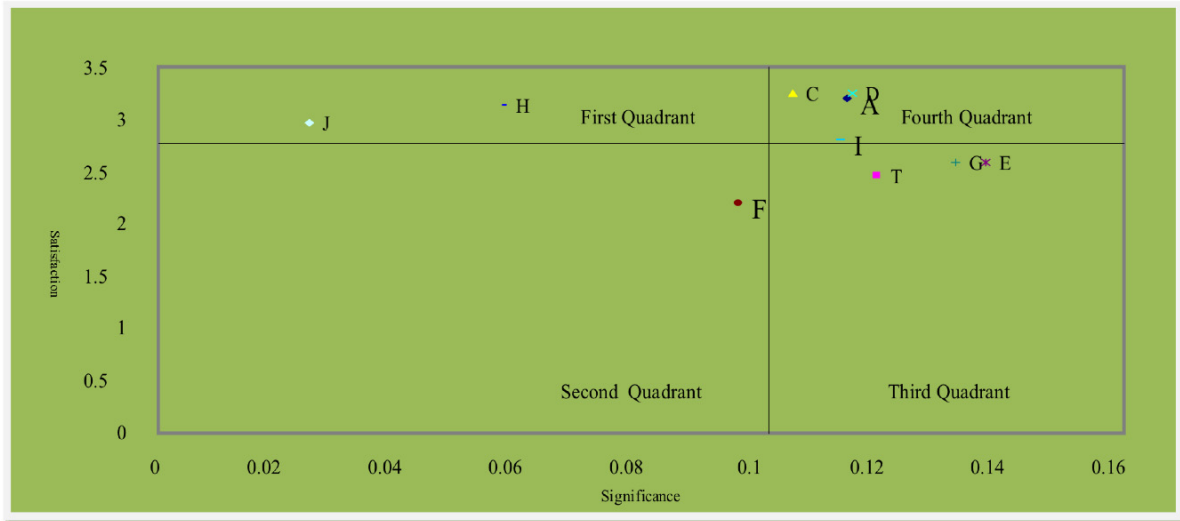


Fig. (1). Diagram of four fuadrants of satisfaction of peasant households.

in a timely manner. The variety resistance, level of agricultural technology, and service attitude are distributed in this quadrant. The results are that a significant evaluation effect of these three contents on overall satisfaction, and currently the situation is that the satisfaction levels are relatively low. The third quadrant is the advantage area. The dots in this quadrant indicate items which are the most important for an overall evaluation with the highest satisfaction. The items in this quadrant shall be continuously maintained and reinforced. The publicity effect, output, popularization contents and selling price of wheat, are distributed in this quadrant. This indicates that the publicity effect of subsidy variety obtained by Chinese government through various approaches was significant. The effect of the increase of output of the subsidy varieties and selling price of wheat are the core contents which the peasant households were concerned about, and the evaluation of these two items showed relative satisfaction. The fourth quadrant is the advantage maintenance

area. The dots distributed in this quadrant indicate items with a relatively low significance, but a relatively high satisfaction. The improved variety subsidy method and subsidy amount, are distributed in this area. This indicates that the improved variety subsidy policy enjoyed popular support, and this task shall be further perfected in the future.

The meaning of each dot in the above diagram are as follows: A: Publicity effect; B: Resistance; C: Output; D: Popularization contents; E: Popularization level of agricultural technician; F: Contact frequency; G: Service altitude; H: Subsidy method; I: Selling price of wheat; J: Subsidy amount [7].

5. CONCLUSIONS AND POLICY SUGGESTIONS

In this study, the satisfaction of the peasant households in regards to the improved variety subsidy policy and its sensitivity, were empirically analyzed based on the investigation

data of the wheat growers in Anhui Province, and by utilizing tools like customer satisfaction models and four-quadrant diagrams. The results indicated the comprehensive evaluation of the peasant households for the improved variety subsidy policy was not high, and the comprehensive score was only found to be 55.38 points. The satisfaction evaluations for the publicity effect, variety output, improved variety subsidy amount and subsidy method, were relatively high. Meanwhile, the results for the service life of agricultural technician, contact frequency, popularization attitude, and variety resistance were relatively low. This indicated that the satisfaction evaluation of the peasant households for the improved variety subsidy policy was not only related to the policy itself, being also closely linked with each process of the policy execution.

In order to further give full play to the lever effect of the improved variety subsidy policy, and to practically guarantee the grain safety of the state, the following counter-measures and suggestions are put forward in this paper:

First of all, further improvement is needed for the improved variety subsidy amount. The price is an important factor influencing the satisfaction of the peasant households for the improved variety subsidy policy. The government should further increase efforts to the improved variety subsidy, offer obvious price advantages to the subsidy varieties, and give full play to the lever effect of the improved variety subsidy policy.

Secondly, enhancement is needed for the screening of subsidy improved varieties. The satisfaction of the peasant households regarding the output of the subsidy variety was relatively high, which indicated that the improved variety subsidy policy already obtained a relatively significant effect in terms of the promotion of technological popularization and the improvement of the grain output. The government should perfect the improved variety subsidy policy, screen subsidy varieties according to principles of openness, fairness and impartiality, increase the investment in the research and development of new varieties, as well as perfect the public bid invitation and the responsibility and accountability systems of the variety suppliers, in order to ensure the advancement of the subsidy varieties.

Thirdly, perfection is needed for the motivation mechanism of the agricultural technology popularization personnel[8-9]. For example, the agricultural technician is a bridge and bond to connect the government with the peasant households, as well as a key factor in the process of the popularization of the agricultural technologies. Currently, the satisfaction of the peasant households in regards to the contact frequency, working attitude and working level of agricultural technology popularization personnel is relatively low. This indicates a relatively low agricultural technology popularization efficiency at a basic level. The government should properly conduct the following tasks: 1. Strengthen the training process of the agricultural technicians to improve their work-

ing ability; 2. Make innovations in the agricultural technician assessment system, perfect the motivation mechanism, gradually form an assessment mechanism with the peasant households as the subject, and practically change the working level and working style of the basic-level agricultural technology popularization personnel; 3. Enhance the investment in the popularization of agricultural technologies, improve the income and working conditions of agricultural technicians, and improve their initiative for engagement in the agricultural technology popularization.

## CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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