Framework of Evaluation Index System for Farmers' Training under the New Situation

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Abstract　At present，income of farmers' training evaluation can not reflect the real connotation of training and the scientific evaluation index system is lacked. Based on this，it is concluded that evaluation of farmers' training is composed of demand evaluation，process evaluation and effect evaluation. Farmers' training evaluation system is evaluated including four grades of indices. Among them，the third grade index include demand investigation，satisfaction degree of peasant household，satisfaction degree of peasant household，organization degree，talent benefit，economic benefit，social benefit. The fourth grade index is the probability of demand investigation，training method，training content，training time，training textbook，teaching facility，tracking service，plan establishment，trainee，trainer，training evaluation，knowledge understanding degree，behavior change rate，growth rate of unit yield，growth rate of unit income，growth rate of output per worker，increasing rate of organization degree and participation degree. Connotation of evaluation index and the mathematical expressions of some indices are described in order to correctly evaluate the effect of training，to improve the quality of training，and to establish the training based on science.

Key words　Farmers' training，Evaluation，Index system，China

　　With the growing interest in research on the " Three Agricultural Problems" , farmers' training, an important means of the modern rural human resources development, has been paid more and more attention by the government. Driving force for rural development is reflected in the increase of land, quantity of labor force, and capital stock, as well as the improvement of knowledge and scientific and technological level of farmers. In recent years, China has introduced a variety of training projects, such as green certificate training, technology training engineering for young farmer, enterprising training project for new farmer, agricultural remote training, rural surplus labor force transfer and employment training project. Therefore, we should further research on the result evaluation of these training programs, the scientific and rational implementation of these trainings and so on. A complete farmers' training index system can help people to correctly evaluate the training, to improve the quality of training, to reasonably carry out training plan, and to improve the scientific establishment of training, which is of important theoretical and practical significance.

1　Problems in the evaluation of farmers' training at present

1.1　Income being unable to reflect the real connotation of the training　At present, many news comments evaluate the effect of farmers' training only from the aspects of the per capita income of farmers and the quantity of training. But in fact, factors affecting the income increase are various, such as policy, climate, market price, family resource endowment, planting and breeding scale. Fluctuation of income has almost concealed the true effect of training and has deviated from the real connotation of training evaluation.

1.2　Lack of scientific evaluation index system　Research shows that using the data of income to evaluate the farmers' training effect is mainly caused by the lack of evaluation index system about the standardization of farmers' training project. At present, few of the periodicals in China report the achievements in the filed of the evaluation on farmers' training. Only a small amount of materials stick at the macro levels. For instance, the " Green Certificate" training project is evaluated from organization, policy and system. From the micro level, there are no further discussions on the training evaluation of single training project or on how to judge the merits of a training project[1 −4].

2　Main framework of index system and the connotation of evaluation index

2.1　Main framework of index system　Farmers' training evaluation is a comprehensive and systematic project, including the demand evaluation before training, the process evaluation during training, and the effect evaluation after training. According to the principles of systematicness, objectivity, scientificity, operability, overall evaluation and giving prominence to the key points, this research establishes the farmers' training evaluation system based on the sufficient investigation, which can be divided into four grades and in all 31 indices. Among them, there are 1 first grade index, 3 second grade indices, 7 third grade indices, and 20 fourth grade indices. Table 1 reports the overall framework of the evaluation index system.

2.2　Connotation of evaluation index

2.2.1　Demand evaluation index. Determination of training demand is the first step of the whole training. Therefore, accurate evaluation of training demand is the basis and prerequisite of training. During the evaluation of training demands, three indi-

ces are designed to be evaluated, including the demand investigation, probability of demand investigation, and satisfaction

degree of demand.

Table 1   Framework of evaluation index system for farmers' training

First grade index	Second grade index	Third grade index	Fourth grade index
Comprehensive evaluation index for farmers' training	Demand evaluation index	Demand investigation	Probability of demand investigation
		Satisfaction degree of demand	–
	Process evaluation index	Satisfaction degree of peasant household	Training method
			Training content
			Training teacher
			Training time
			Training textbook
			Teaching facility
			Tracking service
		Organization degree	Plan establishment
			Trainee
			Trainer
			Training method
			Training evaluation
	Effect evaluation index	Talent benefit	Knowledge understanding degree
			Behavior change rate
		Economic benefit	Growth rate of unit yield
			Growth rate of unit income
			Growth rate of output per worker
		Social benefit	Increasing rate of organization degree
			Participation degree

2.2.1.1   Demand investigation. It reflects that whether the training institutions have investigated the demand of farmers or not before training.

2.2.1.2   Probability of demand investigation. If the demand investigation is carried out, percentage of sample size in the peasant households investigated is taken as the probability of demand investigation. Its equation is

$$DRP = RM/T, \tag{1}$$

where DRP is the probability of training demand investigation, RM is the sample size of demand investigation, and T is the total peasant households in investigation area.

2.2.1.3   Satisfaction degree of demand. The consistency of training content and training demand of index evaluation is regarded as the consistent percentage of the training content and the demand of peasant household. Its equation is

$$DS = CP/M, \tag{2}$$

where DS is the satisfaction degree of training demand, CP is the people having consistency of training content and training demand, and M is the sample size of peasant households participated in training.

2.2.2   Process evaluation index. Training process refers to the concrete implementation stage of training work. Quality of this stage directly relates to the ultimate effect of the training and the realization degree of training objective. In other words, even the training content meet the needs of training demand, or the training plan is perfect, the training objective can hardly be achieved if there are some problems during training process. Evaluation of training process can be divided into two parts. One is the evaluation on the satisfaction degree of peasant household during training by questionnaire survey; the other is the evaluation on the organization degree of training organiza-

tion by organization interview.

2.2.2.1   Satisfaction degree of peasant household. This satisfaction degree index has seven measurement indices, such as training method, training content, training teacher, training time, training textbook, teaching facility and tracking service after training. Satisfaction degree is classified into five grades of very satisfied, fairly satisfied, satisfied, quite dissatisfied, and extremely dissatisfied, the scores of which are 5, 4, 3, 2 and 1, respectively. Hence, the calculation equation of satisfaction degree of peasant households is

$$PC_{ij} = \frac{\sum CP_i \times S_r}{M}, \tag{3}$$

where PC_{ij} is the satisfaction degrees of 7 variables in the process evaluation of training project ($i = 1, 2, 3 \cdots i$, that is, the number of training projects, $j = 1, 2, 3, 4, 5, 6, 7$, that is training method, training content, training teacher, training time, training textbook, teaching facility and tracking service), CP is the number of peasant households selecting a certain score, S_r is the score ($r = 1, 2, 3, 4, 5; S_1 = 5, S_2 = 4, S_3 = 3, S_4 = 2, S_5 = 1$), and M is the effective sample size of peasant households participating in training.

2.2.2.2   Organization degree. Organization degree of training mainly refers to the organization activity and plan arrangement of training by organizations, which has five measurement indices:

(1) Plan establishment. It refers to the establishment of thorough training plan and curriculum plan.

(2) Trainee. This index mainly considers the standard, procedure and gender of trainee.

(3) Trainer. It mainly considers the theoretical knowledge, practical operational capacity, communication and pres-

entation skills of trainer.

(4) Training arrangement. It mainly determines the training time, training location and training method.

(5) Training evaluation. It refers to whether the corresponding evaluation program is made or not.

Calculation equation of organization degree is

$$OET = \frac{\sum S}{O - oet},\qquad(4)$$

where OET is the organization degree of training, $\sum S$ is the total score of measurement indices, which is the total score of five variables during practical operation, $O - oet$ is the score of the optimal organization, which refers to the optimal organization degree of training, that is, the best score.

2.2.3 Effect evaluation index. Evaluation of training effect is the investigation and determination of training activity and actual performance of training activity. Any problem in the training activity will lead to the poor effect of training. Therefore, training effect is the primary standard to test the training. The direct beneficiary of training activity is the trainee, includes the changes of knowledge, skill, attitude and behavior of trainee, and the direct economic benefits of trainee. Moreover, the effect of training activity also includes the social benefits brought by training. Therefore, training effect of this index system is classified into three measurement indices of talent benefit, economic benefit and social benefit.

2.2.3.1 Talent benefit. Index of talent benefit has 2 fourth grade indices, such as knowledge understanding degree and behavior change rate.

(1) Knowledge understanding degree. Knowledge understanding degree of farmers not only directly relates to the farmers' mastering degree of knowledge, but also affects the farmers' application of training content. The equation is

$$U = \frac{\sum CP \times S_i}{M},\qquad(5)$$

where U is the understanding degree of farmers after the course, CP is the number of people selecting a certain understanding degree, and S_i is the score. Understanding degree of the trainee is divided into four layers of understanding, basic understanding, little understanding and not understanding, the scores of which are 4, 3, 2 and 1, respectively, that is, $S_1 = 4$, $S_2 = 3$, $S_3 = 2$, $S_4 = 1$.

(2) Change rate of behavior. The ultimate objective of training is to change the behavior of peasant household. Only when the peasant household has changed its behavior, can we achieve the desired results of training. Its calculation equation is

$$AC = CP/M,\qquad(6)$$

where AC is the change rate of behavior, CP is the number of people changing their behavior, and M is the sample size of peasant households participating in the training.

2.2.3.2 Economic benefit. Economic benefit has 5 fourth grade indices.

(1) Growth rate of unit yield. It refers to the ratio of added value of unit yield to the unit yield before training. The equation is:

Growth rate of unit yield = added value of unit yield/unit yield before training × 100%. (7)

(2) Growth rate of unit income. It refers to the ratio of added value of unit income to the unit income before training. The equation is:

Growth rate of unit income = added value of unit income/unit income before training × 100%. (8)

(3) Growth rate of output per worker. It refers to the ratio of the average added value of output per worker to the output per worker before training, that is

Growth rate of output per worker = average added value of output per worker/ output per worker before training × 100%. (9)

(4) Growth rate difference of unit yield. It refers to the difference of the ratios of the added value of unit yield between peasant households having and having not participating in training to the unit yield before training. Its equation is

Growth rate difference of unit yield = unit yield growth rate of peasant households participating in the training – unit yield growth rate of peasant households not participating in the training. (10)

(5) Growth rate difference of unit income. It refers to the difference of the ratios of the added value of unit income between peasant households having and having not participating in training to the unit income before training. Its equation is

Growth rate difference of unit income = unit income growth rate of peasant households participating in the training – unit yield growth rate of peasant households not participating in the training. (11)

Among the five economic benefit indices mentioned above, the former three are designed in the evaluation index system. But the growth rate difference of unit yield and the growth rate difference of unit income are not in the main framework of index system and are mainly used for the comparative study, indicating that there is differences of income and yield between peasant households having and having not participating in training. Therefore, the growth rate difference of unit yield and the growth rate difference of unit income are used to evaluate the result of training.

2.2.3.3 Social benefit. Social benefit has two measurement indices.

(1) Increasing rate of organization degree. It refers to the increasing rate of peasant households before and after participating in the training. In this paper, increasing rate of organization degree mainly refers to the increasing rate of organization degree caused by training. Organization degree in effect evaluation is not the same organization degree in process evaluation, but refers to the change of farmers joining in the farmer organizations before and after training. It's equation is

$$sh = \frac{Opa - Opf - nTb}{M} \times 100\%,\qquad(12)$$

where sh is the increasing rate of training organization degree, Opa is the number of people participating in farmer organization in sample after training. Opf is the number of people participating in farmer organization in sample before training, nTb is the number of people participating in farmer organization not due to the training, and M is the sample size of peasant households participating in training.

(2) Participation degree. It refers to the proportion of

peasant households participating in training in the peasant households should participating in training, which mainly considers the distribution and equity. The equation is

$$PR = M/OM, \qquad (13)$$

where PR is the participation degree, M is the sample size of peasant households participating in training, OM is the number of peasant households should participating in training, including the sum of peasant households participating in training, the peasant households who would like to participate in training but have not heard the news, the peasant households who have some restrictions but have no opportunity to participate in training.

3 Discussion

According to the problem of the lack of farmers' training evaluation index system in China at present, an evaluation index system with better pertinency is established. At the same time, farmers' training is evaluated from three aspects of demand, process and effect. And training effect is comprehensively and systematically reflected in order to improve the training plan and management level based on science. This evaluation index system is simple and practicable, has strong operability, and is more suitable for micro-level. It includes the evaluation of training programs in certain scale with the objective of increasing farmers' income and technical level in rural areas. However, framework of this index system still belongs to exploratory or experimental research, offering a basic evaluation index in embryo. This index system aims to further strengthen the local governments' importance understanding of farmers' training, to improve the quality of training, to evaluate the train-

ing scientifically and rationally, to make training and training evaluation more systemic, scientific and operational, to improve the farmers' cultural knowledge and science and technology, and to avoid the training and training evaluation to become a mere formality.

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use change has no significant impact on ecosystem at present.

4.2 Discussion Calculation of the ecosystem service value in Guangdong Province is only a preliminary estimation. And evaluation on the function and value of personalized service in Guangdong Province is based on the data in two time periods, which is not comprehensive enough and can not analyze the environmental benefit of land use dynamic change. Due to the complexity of ecosystem service, accounting method still needs to be improved and evaluation on ecological environment of land use dynamic change remains to be further studied.

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