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Knowledge based assessment of trained certified farm advisors (CFA) on organic farming

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ABSTRACT

An inter-organizational certificate course i.e. Certified Farm Advisor (CFA) in Organic Farming was jointly organized by National Institute of Agricultural Extension Management (MANAGE), Hyderabad and ICAR-Indian Institute of Farming Systems Research, Modipuram, Meerut during 2019. The objective of this certificate course was to create a cadre of "Certified Farm Advisors" in appropriate technologies of organic farming and enable them to deliver effective "Technical Advisory Services" and thereby solving the field level problems faced by the organic farmers/entrepreneurs/startups or other related stakeholders. A 15 days CFA module II was organized at ICAR- Indian Institute of Farming Systems Research, Modipuram, Meerut in two batches with 50 trainees from 15 different states and union territories. In the present study, the learning, knowledge and skill levels of the participants were analyzed. Multiple regression analysis showed that, gender, service experience and serving region significantly affected the learning ability of trainees. There was significant improvement in the knowledge and skill of trainees in various aspects of organic farming, viz. organic standards, certification and marketing network (study area A); technology package (study area B) and general knowledge (study area C). Based on the training effectiveness scores (TES), maximum improvement was observed with general knowledge of organic farming with 103.73% improvement. However, study area A and B exhibited 45.41% and 34.88% improvement, respectively. Further, the success of this inter-organizational training programme could serve as a model for streamlining HRD programmes on organic farming in the country.

Keywords: Certified Farm Advisor, Marketing network, Organic certification, Organic farming, Organic standards, Technology package, Training effectiveness score

Organic farming is a holistic food production management system which promotes and enhance agro-ecosystem health, including biodiversity, biological cycles, and soil biological activities (FAO 2002). Presently, India ranks first in number of organic producers (1.15 million) and ninth in terms of cultivated area (2.29 million hectares) occupied under organic cultivation (Willer and Lernoud 2019, Das *et al*. 2020). Due to increasing demand of organic produce in national and international markets, a huge potential exists for export and marketing of organic inputs and outputs thereby generating employment opportunity (Ravisankar *et al*. 2017, Kumar and Mehrotra 2017). In spite of huge scope, the growth of organic farming is not as per the expectation in India. While explaining the reasons for slow growth of organic farming in India, Bhardwaj and Dhiman (2019) rated lack of awareness on top. Thapa and Tripathi (2010) also suggested for widespread dissemination of the knowledge and technology through various platforms for success of organic farming in the country. For promotion of organic farming in the country, there must be a cadre of professionally trained personnel who can provide a technical backstopping to farmers and farm managers for scientific organic farming technologies. Hence, a strong national level HRD programme in the field of organic farming is need of the hour.

CFA is an Inter-Organizational Certificate Course Programme launched during 2017 by MANAGE, Hyderabad for enhancing the core competencies of public and private extension professionals in appropriate technologies of Agriculture and allied sectors to enable them to deliver effective "Technical Advisory Services". This certificate course includes three phases i.e. Module-I (organized by MANAGE through e-platform), Module-II and Module-III (application of technology at work place of trainees for a period of 9 months). Module-II is the advanced learning phase through practical demonstrations and study visits at

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identified Institutes from National Agriculture Research System (NARS) for a period of 15 days.

So, in the present investigation, an attempt was made to evaluate the effectiveness of CFA in Organic Farming Module-II based on the knowledge and skills gained by the participants.

MATERIALS AND METHODS

The present CFA Module-II in Organic Farming was organized at ICAR- Indian Institute of Farming Systems Research, Modipuram, Meerut, Uttar Pradesh in two batches i.e.10-24 October, 2019 (Ist Batch) and 05-19 December, 2019 (IInd Batch) in which 50 trainees participated from 15 different states and union territories of India. The total programme schedule was designed to cover all aspects of the four pillars of organic farming i.e. organic standards, certification/regulatory mechanisms, technology package and marketing network, and also some general aspects of organic farming depending upon their scope and importance (Chandrashekar 2010, Deshmukh 2010). Training is the systematic effort for acquisition of knowledge, skills, and competencies which is brought through teaching of vocational or practical skills and knowledge that relate to specific useful competencies (Jain 2014, Roy *et al*. 2018). Kirkpatrick (1996) model presented four levels of measurement for evaluating a training programme. The first level of measurement denoted to reaction, means how well the trainees liked the training program. The second level of measurement was learning, which was determined by improvement in knowledge, attitudes and skills of trainees during the training. The third level of measurement was defined as behavior. In the present investigation, we used level two measurements of Kirkpatrick's model to know the actual gain in the knowledge, attitudes, and skills of trainees during CFA Module-II in Organic Farming which is going to be actually utilized at their work field.

All the trainee participants were given a set of questions at start and end of the training for pre and post evaluation purposes. The evaluation consisted of 40 questions comprising of different study parameters under A, B and C categories. Category A deals with organic standards, certification and marketing networks; B represents technology package, while C indicates general knowledge of organic farming. Organic standards refer to the set of inputs or package of practices allowed as per national regulations, for organic production of a particular commodity (crops, livestock etc.). Certification is the process of certifying and distinguishing organic products (process) from conventionally produced products (process). It guarantees that, a particular commodity (crops/livestock etc.) is produced using inputs and techniques following national/international standards. Technology package refers to the set of practices used from crop planning to harvesting and processing of organic commodities with an objective to get maximum possible yield and quality of the produce. Marketing network is fourth and most important pillars of organic farming which is the intended to provide a better marketing platform (traditional or digital) to producers and sellers for getting premium price of their organic produce. During the evaluation of CFA Module-II, performa was designed to have questions from A, B and C category according to their importance and weightage. Composition and share of questions from different categories are:

Category A : 07 (17.50%)
Category B : 25 (62.50%)
Category C : 08 (20.00%)
Total : 40 (100%)

To evaluate the performance of trainees in pre and post training, a score was developed for each parameters i.e. training effectiveness score (TES) which was adopted from Roy *et al*. (2018) with partial modification as given below:

$$\text{Training efftiveness score (TES)} = \frac{\text{Total score obtained by respondent}}{\text{Maximum possible score}}$$

The score obtained by each respondent to the maximum possible score obtained was calculated for all 50 trainees. Later, these scores were considered to measure the factors influencing the trainees learning effectiveness with other socio-economic characteristics. Multiple linear regression analysis executed with total TES as dependant variable and independent variable as follows; age and education in number of years, gender given dummies (male:1, female:0), service experience in years and participant's serving regions with dummies (north:0, east:1, west:2, south:3).

RESULTS AND DISCUSSION

Influence of social characteristics on training effectiveness: Effectiveness is an essential indicator for terminal evaluation of any training programme. Terminal evaluation helps to assess the usefulness of training by the implementing as well as sponsoring organizations (Roy *et al*. 2018). The social characteristics of trainees are important factors which were assumed to influence their performance and training effectiveness. The variables under different social characteristics were analyzed critically and their primary descriptions on different social characteristics of trainees and category wise score are presented in Table 1. However, the influence and significance level of different social characteristics on training effectiveness score are given in Table 2.

It is evident from the data (Table 1) that, majority of the trainees (64%) falls under age group of equal to or more than 30 years. The highest educational qualification of trainees was also analyzed in the study. Maximum trainees (44%) were found to have Masters Degree. However, 42% of trainees were found to hold graduate degree. Only 14% trainees were having Doctorate degree. In the present study, the effect of age and education level of trainees on training effectiveness was found non-significant (Table 2). Guerra-Carrillo *et al*. (2017) studied the effect of education and age on learning efficacy and found that, the difference in learning ability of graduate and post graduate was very narrow. Since all the trainees in our case possesses graduate or higher degrees so, the non-significant effect of education

Table 1 Social characteristics and training effectiveness of Trainees of CFA II in Organic Farming

Social characteristics of trainees	Classification	No. of trainees	Share of total participants (%)	% Marks obtained	
				Pre-training evaluation	Post-training evaluation
Age	<30 yrs.	18	36	57.95	87.73
	>30 yrs.	32	64	59.55	84.55
Education	Graduate	21	42	60.60	87.26
	Masters	22	44	56.93	86.36
	Doctorate	7	14	59.64	80.71
Gender	Male	31	62	57.66	83.39
	Female	19	38	60.79	90.13
Service experience	<8 yrs	30	60	57.20	85.61
	>8 yrs	20	40	62.06	86.62
Serving region	North	4	8	54.38	73.13
	East	13	26	57.79	86.44
	West	7	14	58.27	89.42
	South	26	52	66.43	85.00
Rank	Group A	8	16	60.31	82.50
	Group B	37	74	58.18	87.30
	Others	5	10	61.50	81.50

Training Effectiveness Score (TES)

Study Parameters	Subject	Number of questions	Pre-training TES	Post-training TES	Per cent improvement
A	Organic standards, Certification and Marketing network	7	0.560	0.814	45.41*
B	Technology package	25	0.656	0.884	34.88*
C	General knowledge of organic farming	8	0.402	0.820	103.73*
	Total	40	1.618	2.519	55.64*

* Significance at 1% level (t-test).

level on training effectiveness score is in accordance with the findings of Guerra-Carrillo *et al*. (2017). During their study, they also found that young adulthood (generally between 18-30 years) showed the peak performance of learning. In our case, the learning ability (average percentage score) of the trainees below 30 years was more than that of trainees having age of equal to 30 years or more, but has no significant difference among them.

Other social characteristics like gender, region, and service experience showed significant effect over TES (Table 2). Out of total participants, 62% were male and 38% female. There was significant effect of gender on the TES. Female trainees secured more marks (60.79% in pre and 90.13% in post) than the male trainees and the data were highly significant. It indicates that, increasing the number of female participants will have more outcomes in CFA II in Organic farming. In her study, Kovács (2019) found that, men and women do differ in their ability to gain the theoretical knowledge. Region was another social characteristic which was found to significantly affect the learning ability of trainees. Based on region, trainee respondents were divided into four groups i.e. North, East, West and South depending upon position of their State in India. There was minimum participation (8%) from North whereas maximum participation (52%) was from Southern states of the country. Eastern states represented 26% participation while Western states accounted for 14% participation. Minimum percentages of marks (54.38% in pre and 73.13% in post) were secured by participants from North region. However, the results of South (66.43% in pre and 85.00% in post) and Eastern region (57.79% in pre and 86.44% in post) participants were highly significant.

Table 2 Factors influencing the participants for training effectiveness

Variable	Coefficients	Stan. error	P>|t|
Dependent variable: training effectiveness score (TES)			
Age	-0.010	0.0082	0.194
Education	-0.013	0.0212	0.531
Gender	-0.224	0.0742	0.004*
Service experience	0.023	0.011	0.039**
East region	0.455	0.1515	0.005*
West region	0.298	0.1527	0.058***
South region	0.314	0.1444	0.035**
Rank A	0.038	0.1396	0.785
Rank B	0.050	0.0697	0.472
Constant	2.665	0.4284	0.5

*, **, *** Significance at 1%, 5% and 10% level respectively.

The performance of west region participants in terms of knowledge gain (58.27% in pre and 89.42% in post) was also significant. One of the reasons for lower participation from North and West region may be the difficulty in communicating english language which is the main medium during online course of Module I of CFA in Organic Farming.

Many of the regions of Eastern India are either declared as organic (e.g. Sikkim) or by default organic due to less or no use of chemical fertilizers and pesticides in these regions. Higher level of participation and excellent performance in knowledge gain by Eastern region participants is a positive sign towards human resource development (HRD) and thus, preparedness for the spread of scientific organic farming technologies in this region. Maximum participation and excellent performance in training evaluations by South Indian trainees indicates towards their higher degree of orientation towards organic farming. Aulakh and Ravisankar (2017) advocated the 'niche area-niche crop' concept for promotion of organic farming in the country. They also explored better possibilities for promotion of organic farming in eastern parts of India particularly hilly states, which are least encroached by green revolution technologies. A strong cadre of trained personnel in scientific organic farming through CFA II will have better potential to support organic farming in these areas.

Service experience is another social character which was assumed to affect the learning behaviour of trainees. During the present study, service experience was found to pose significant effect on learning ability of the trainees (Table 2). More experience (8 or >8 years) resulted in higher percentage of marks in pre as well as post training evaluations (62.06% in pre and 86.62% in post). Greater service experience may have better understanding of the things and thus, positively influencing the learning ability of the trainees. During his study on role of experience in learning and critically reviewing the context, Hansen (2000) nicely correlated the experience with learning ability of a person. As per his analysis, the real learning begins with and hinges upon the experiences of the learner.

Effectiveness of CFA II in organic farming in context to different study parameters: There was significant improvement in learning of the trainees on different study parameters (Table 1). The t-test (P=0.01) was found highly significant for all the study parameters i.e. parameter 'A', parameter 'B' and parameter 'C'. Overall improvement in training effectiveness score (TES) was observed as 55.64 per cent. Among different study parameters, maximum improvement (103.73%) in the knowledge of trainees was recorded with parameter 'C' which pertains to general knowledge of organic farming. It was followed by the study parameter 'A' (45.41% improvement), which is related to organic standards, certification and marketing network. For study parameter 'B' (technology package), which found major coverage in training curriculum and maximum number of questions during evaluations, an improvement of 34.88% was recorded. Though, the highest TES (0.884) during post-training evaluation was also recorded with this parameter which is equal to 88.4% marks.

The overall improvement of 56.64% in the knowledge of trainees during CFA II in organic farming is of paramount importance especially when the trainees were admitted through a well designed Module I with better knowledge background of organic farming as it is evident from their 53.95% mean marks in pre training evaluation. The practical and demonstration oriented course curriculum of CFA II was an experiential learning in true sense. It was resulted in the gain of knowledge and skill of trainees in all study areas, i.e. four pillars of organic farming and general knowledge of organic farming. One implication of this training programme could be to search out the weaker areas of trainees and give more focus on that during the training. The weaker part of trainees was general knowledge of organic farming (TES=0.4025 in pertaining evaluation), but maximum improvement of 103.73% was also recorded after the training for this study area. This indicates towards well designed course content of CFA II in organic farming.

Next best improvement (45.41%) in the knowledge and skill of trainees was seen in case of the study area 'A' which is related to organic standards, certification and marketing network. The knowledge and skills related to this study area is very important for the purpose of using the correct and permissible inputs and package of practices for organic farming; certification and branding of organic products; and seeking desired premium price by selling the produce through best marketing platform. In India, the knowledge level of most of the trainers and organic growers for study area 'A' is not up to the mark and this poses difficulties in distinguishing organic produce from traditional one; accessibility of the market network and thus getting optimum premium price. Nowadays, most of the companies are investing much on branding and advertisement of their products through popular marketing platform. In this way, the high level of improvement in

study area 'A' of CFA II of organic farming may be helpful for promotion of organic farming in the country through its strong cadre of trainees. The promotion and availability of organic inputs and package of practices; easy and user friendly certification system; and proper marketing network as essential part for encouraging the organic farming was advocated by several workers (Chandrashekar 2010, Kritika *et al.* 2013, Deshmukh and Babar 2015, Scialabba 2015, Ravisankar *et al*. 2017, Das *et al*. 2020).

The well designed training module of Certified Farm Advisor in general and inter-organizational collaborative mode of its execution during module II in particular, has resulted in excellent transfer of knowledge and skill of organic farming to participants as it is evident from the performances of trainees in post-training evaluations. Social characteristics i.e. gender, service experience and region were found to significantly affecting the learning ability of the trainees. Since female participants showed significantly higher learning ability than the male, hence increasing the ratio of female participants would result in transfer of more organic farming technologies through CFA-II. Likewise, trainees with more service experience would result in greater improvement in the knowledge about organic farming. Trainees from Eastern region followed by Southern region of the country showed greater improvement in their knowledge and skill on organic farming. Hence, extra efforts will be required to encourage the participation from Northern and Western parts of the country.

The overall improvement in the knowledge and skill (56.64%) of trainees of CFA II in organic farming can be rated as excellent for the trainees who were admitted through a well designed Module I with better knowledge background of organic farming. The excellent gain in knowledge and skills of trainees on all the targeted study area of organic farming i.e. organic standards, certification and marketing network; technology package and general knowledge will be helpful for creating strong cadre of organic farming advisors in the country.

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