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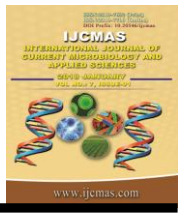

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Training Needs Assessment of Agricultural Extension Personnel in Arunachal Pradesh, India

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A B S T R A C T

The present study was conducted in the State Arunachal Pradesh during 2015-2016. Three districts viz., Papumpare, East Siang and West Siang were purposively selected based on the highest number of filled up post of agricultural officer. There are all total 64 officials in these three districts. So census method was followed for selecting the respondents. The 'perceived training needs' of respondent was the dependent variable of the study. The data were collected through interview schedule. The study also revealed that majority of the respondents had high level of training needs (63.30%). The most important training need areas are Plantation crop (2.90), Animal husbandry (2.90) and Plant Pathology (2.80). Based on the Training importance Score (TIS), the training needs were higher in micronutrient problem in acid soils and management; use of organic manure as fertilizer, azolla - its growth, production and uses; acid soils-fertility management and problems; green manuring, showing of nutrient deficiency symptom, fertilizers reactions in soil and fertility. With time the training needs of the extension personnel changes therefore, the training needs assessment should be done frequently and the important areas in which the extension personnel needs training should be considered while planning training for the extension personnel.

Introduction

Agriculture is the backbone of the Indian economy and plays a vital role in the overall development of the nation (DES, 2012). It contributes to 13.9 per cent of National Gross Domestic Product (GOI, 2014). However, Indian agriculture is facing serious challenges because of its ever-increasing population, limited land and water availability, and degradation of natural resources. It is desirable to increase agricultural productivity in a sustainable manner. The excessive use of agro-chemicals over past decades has deteriorated soil health leading to declines of crop yields and produce quality (Yadav,

2011). This calls for a greater co-ordination between research and extension. Hence, the need for strengthening the extension-personnel through effective training programmes has become an integral part of the agricultural strategy. Extension agents particularly require experiential learning that provides them with opportunities to relate to rural people in an interactive process that combines scientific technical knowledge with local indigenous knowledge in client-centered problem solving activities (Radhakrishna and Thompson, 1996) The Department of Agriculture, Arunachal Pradesh plays a very important role for the development of agriculture in the state. Various programme and activities are carried out by the Department of Agriculture through extension personnel to achieve the goals and visions set by them. Extension personnel deals with communicating and disseminating of information and technologies to farmers.

The department needs well trained extension personnel for successful implementation of the programmes. Training is a crucial and continuous requirement and effective tool for capacity building, skill and knowledge development. It is therefore crucial to provide training to the extension personnel so that they can perform their job more efficiently and effectively. The present production of food grains in the state of Arunachal Pradesh is 246,000 tonnes whereas the present requirement is 276,000 tonnes (Anonymous, 2010). The demand of food grain by 2020; is 263,000 tonnes, whereas the requirement will be 310,000 tonnes (Anonymous, 2010). So in order to meet the expected future requirements of food grains the extension personnel should be equipped with modern tools and techniques of training methods so as to work for the grass roots. The study is taken up with the objective that the study will help the Department of Agriculture and other training organizations to have better understanding about the factors to be considered for organizing training. Against this background the present study was conducted to study the training needs of extension personnel with objective: To identify the perceived training needs of selected agricultural extension personnel.

Materials and Methods

The present study was conducted in the State, Arunachal Pradesh during 2015-2016. There are nineteen districts in the State, from which three districts *viz*., Papumpare, East Siang and West Siang were purposively selected based on the highest number of filled up post of agricultural officer. The organizational hierarchy of Agricultural officer in Arunachal Pradesh is District Agriculture Officer (DAO) - Sub Divisional Agriculture Officer (SDAO) – Agriculture Development Officer (ADO) – Agriculture Research Officer (ARO). There are all total 64 officials in these three districts. So census method was followed for selecting the respondents. Out of the total 64 respondents, 60 responses were received. Hence, the total respondents of the study were 60. Primary data was collected by interview schedule and training items were consulted with the experts of state agriculture department. The training needs of agricultural/horticultural officers were worked out with the help of Training Need Quotient (TNQ) developed by Sidhu (1973). The formula for calculating TNQ is as follow:

$$TNQ = \left(\frac{OTig}{MTS} \times 100 \right)$$

Where,

OTig = Sum of observed training scores of the items of the i^{th} respondent

MTS = Sum of the maximum training scores attributed to the items rated by i^{th} respondents

TNQ = Training Need Quotient

The training importance score (TIS) of each item was calculated with the following formula:

$$TIS = \frac{\text{Cumulative training importance score over all the respondents}}{\text{Number of respondents}}$$

Further the training importance score of an area (ATIS) was computed out with the following formula:

$$ATIS = \frac{\text{Sum of training importance score of all items in an area}}{\text{Number of items included in the training area}}$$

Results and Discussion

Based on the Training importance Score (TIS), the different areas when arranged in descending order of their ranks are micronutrient problem in acid soils and management (3.18), use of organic manure as fertilizer (3.16), azolla - its growth, production and uses (3.14), acid soils-fertility management and problems(3.14), green manuring (3.06), showing of nutrient deficiency symptom, fertilizers reactions in soil and fertility (3.04), symptoms and control of important diseases of rice (3.00), cultivation of rubber (3.00), symptoms and control of important diseases of summer/winter vegetables (2.97), post-harvest technology of different crops (2.97), crop insurance scheme (2.96), integrated pest management (2.95), preparation and use of different audio visual aids(2.95), bio-control of insects (2.94), identify symptoms and nature of damage caused by insects (2.93), symptoms and control of important diseases of fruits (2.93), cultivation of tea (2.93), marketing/selling/ distribution of agri products (2.93), selection and use of extension teaching methods (2.93), marketing of products of poultry (2.93), cultivation of pepper (2.92), soil conservation measures (2.92), plant protection equipments-their care maintenance and minor repairing (2.92), symptoms and control of important diseases of maize (2.83), *etc.*

Table.1 Distribution of respondents according to their levels of training need (n=60)

Sl. No.	TNQ Categories	Frequency	Percentage (%)	Mean	S.D
1	Low (<71.75)	14	23.30	79.57	9.53
2	Medium (71.75-80.98)	8	13.40		
3	High (>80.98)	38	63.30		

23.30 per cent of the respondents have low level of training needs, 63.30 per cent of the respondents have high level of training needs and only 13.40 per cent have medium level of training need.

Table.2 Distribution of items on the basis of training importance score categories (n=178)

Sl. N0.	TIS Categories	Frequency	Percentage (%)	Mean	SD
1	Less Important (<2.60)	24	13.50	2.75	0.16
2	Important (2.60-2.91)	104	58.40		
3	Most Important (>2.91)	50	28.10		

Out of 178 items, the extension personnel rated 50 items (28.10%) as most important, 104 items (58.40%) were rated as important and 24 items (13.50%) were rated as less important.

Table.3 List of important training need items with their ranks as rated by agricultural extension personnel

Training Areas (total no. of items included =178)	Training items no.	Training items	TIS	Rank
Soil Science (n= 19)	13**	Micronutrient problem in acid soils and management	3.18	I
	14**	Use of organic manure as fertilizer	3.16	II
	16**	Azolla - it's growth, production and uses	3.14	III
	9**	Acid soils-fertility management and problems	3.14	III
	2**	Green manuring	3.06	IV
	18**	Showing of nutrient deficiency symptom, fertilizers reactions in soil and fertility	3.04	V
	19*	Management of soil edaphic factors for improving the productivity of soil	2.67	VI
	1*	Use of different fertilizer, time and method of application	2.67	VI
	5*	Precautions necessary in the use of fertilizers	2.65	VII
	8*	Soils of Arunachal Pradesh, nature and characteristics	2.62	VIII
	3*	Soil test crop response	2.60	IX
	12	Losses of N from the soil of humid and efficient use of N-fertilizers in these soils	2.58	X
	15	Blue green algae- it's growth and uses in wet land rice culture	2.58	X
	10	Submerged soils- characteristics, fertility and management	2.57	XI
	17	Rhizobium - it's production technology and uses	2.55	XII
	7	Conversion agriculture	2.50	XIII
	6	Conversion of quantity of plant nutrients in to quantity of fertilizers for different crops	2.48	XIV
	4	Construction of biogas plant	2.47	XV
	11	Phosphate availability in acid soil, problem and management	2.45	XVI
Entomology (n =17)	4**	Integrated pest management	2.95	I
	5**	Bio-control of insects	2.94	II
	7**	Identify symptoms and nature of damage caused by insects	2.93	III
	8*	Symptoms and control of important pests of rice	2.82	IV

	9*	Symptoms and control of important pests of maize	2.82	IV
	11*	Symptoms and control of important pests of summer vegetables	2.82	IV
	1*	Symptoms and control of important pests of winter vegetables	2.80	V
	6*	Symptoms and control of important pests of fruits	2.80	V
	2*	Identification of different pests infesting agricultural/horticultural crops and their management	2.73	VI
	14*	Symptoms and control of important pests of pulses	2.72	VII
	17*	Precautions in handling and storing of pesticides and use of antidotes in case of accidents	2.70	VIII
	3*	Pest surveillance for effective management of pests	2.67	IX
	10*	Symptoms and control of important pests of arecanuts	2.65	X
	12*	Trade name, chemical name and properties of pesticides	2.65	X
	16*	Storage insect pests and their management	2.63	XI
	13*	Selection, maintenance, use and care of different sprayers, dusters etc.	2.62	XII
	15	Rodent pest management	2.57	XIII
Agronomy (n = 13)	1*	Weed management (identification and control	2.80	I
	13*	Integrated farming system	2.78	II
	12*	Crop rotation	2.73	III
	7*	Rice cultivation and it's management	2.70	IV
	3*	Water management/irrigation of different crops	2.68	V
	11*	Problem management	2.67	VI
	10*	Cropping system	2.65	VII
	9*	Soil management in different crop situation	2.63	VIII
	2*	Fertility management	2.62	IX
	6	Use of different implements	2.58	X
	8	Seed rate and method of showing	2.58	X
	5	Cultural management in crop yield	2.55	XI
	4	Production technology of crops	2.52	XII
Plant pathology (n = 15)	3**	Symptoms and control of important diseases of rice	3.00	I
	7**	Symptoms and control of important diseases	2.97	II

		of summer vegetables		
	8**	Symptoms and control of important diseases of winter vegetables	2.95	III
	9**	Symptoms and control of important diseases of fruits	2.93	IV
	4*	Symptoms and control of important diseases of maize	2.83	V
	1*	Identification of plant diseases, different symptoms	2.82	VI
	5*	Symptoms and control of important diseases of pulses	2.82	VI
	2*	Preparation of doses of chemical and their method of application	2.78	VII
	6*	Symptoms and control of important diseases of tubers	2.78	VII
	12*	Integrated management of plant diseases	2.72	VIII
	10*	Symptoms and control of important diseases of arecanut	2.70	IX
	14*	Accident from use of chemicals-first aid and treatment	2.68	X
	11*	Fungicides and their application	2.67	XI
	13*	Control of diseases after harvesting	2.65	XII
	15*	Diseases survey and estimation of losses and forecasting	2.65	XII
Nematology (n = 5)	4*	The nature of damage of nematodes and their management in horticultural crops	2.67	I
	5*	Importance of nematicides used in different crops	2.67	I
	1*	General outline of plant parasitic nematode and their importance in agriculture	2.65	II
	3*	The nature of damage of nematodes and their management in field crops	2.65	II
	2	Plant nematode relationship	2.50	III
Horticulture (n = 13)	4*	Production technology of winter vegetables	2.72	I
	3*	Production technology of of summer vegetables	2.70	II
	13*	Growing vegetables/ flowers in poly-house/green house	2.68	III
	11*	Method of pruning, grafting and stalking	2.67	IV
	2*	Nursery development and orchard management	2.65	V
	12*	Propagation by seed and by vegetative mean	2.62	VI
	1*	Problems and prospects of horticultural development in NE India	2.60	VII

	8	Scope of cultivation in minor and indigenous fruits and vegetables of Arunachal Pradesh	2.58	VIII
	10	Problems and prospects of seed production and flower and nursery development	2.57	IX
	7	Simple method of processing fruit and vegetable for preservation	2.55	X
	5	Scope and importance of tuber crops cultivation in Arunachal Pradesh	2.53	XI
	9	Advance in production technology of commercial flowers	2.48	XII
	6	Scope and importance of floriculture in Arunachal Pradesh	2.47	XIII
Plantation crop (n = 4)	2**	Cultivation of Rubber	3.00	I
	1**	Cultivation of Tea	2.93	II
	3**	Cultivation of Pepper	2.92	III
	4*	Plantation crops-special features, importance, existing plantation crops, scope of cultivation in Arunachal Pradesh	2.73	IV
Ag. Extension (n = 11)	7**	Preparation and use of different audio visual aids	2.95	I
	2**	Selection and use of extension teaching methods	2.93	II
	9*	Womens's programmes and activities	2.73	II
	1*	Techniques of conducting training programme	2.67	IV
	10*	Extension administration	2.65	V
	3*	Role of demonstration in the present system of extension	2.63	VI
	8*	Information communication Technology	2.63	VI
	6*	Problems of adoption and diffusion of farm innovation	2.62	VII
	4*	Ideas about current agriculture development programmes	2.60	VIII
	5	Study on agencies and organizations related to extension service	2.57	IX
	11	Common Property Resource Management	2.48	X
Ag. Engineering (n = 7)	7**	Post-harvest technology of different crops	2.97	I
	2**	Soil conservation measures	2.92	II
	3**	Plant protection equipments- their care maintenance and minor repairing	2.92	II
	4*	Storage structures	2.67	III
	5*	Agricultural processing implements	2.65	IV
	6*	Practical demonstration in using of equipments	2.65	IV

	1*	Farm stead irrigation system and design: appropriate technology	2.65	IV
Ag. Economics (n = 6)	6**	Crop Insurance Scheme	2.96	I
	3**	Marketing/selling/distribution of agril. products	2.93	II
	1*	Farm management and production economics	2.65	III
	5*	Kisan credit card	2.65	III
	2*	Agricultural finance & sources of loan and knowledge of different credit institutions/agencies	2.65	III
	4	Resources economics	2.50	IV
Plant breeding (n = 8)	3**	Improvement of rice	2.97	I
	2**	Improvement of pulse	2.95	II
	4*	Seed production and certification	2.77	III
	8*	Problems of major fields of Arunachal Pradesh in respect of (i) germplasm collection, (ii) seed production certification and (iii) varietal description	2.77	III
	6*	Varietal description of important crop of Arunachal Pradesh	2.75	IV
	1*	Breeding crops, pollinated crops with special reference to maize	2.69	V
	5*	Crop germplasm collection, conservation, evaluation and utilization	2.67	VI
	7*	Improvement of vegetatively propagated crops	2.65	VII
Animal husbandry (n = 22)	13**	Marketing of products of poultry	2.97	I
	18**	Environmental effects of fish farming	2.97	I
	7**	Management of piggery farm	2.95	II
	11**	Techniques of low cost housing of poultry	2.95	II
	12**	Poultry litter as manure	2.95	II
	15**	Sustainable feeds of fish	2.95	II
	17**	Breeding and reproduction of fish	2.95	II
	14**	Management of poultry farm	2.93	III
	16**	Nutrition and health of fish	2.93	III
	2**	Techniques of low cost housing of piggery	2.92	IV
	5**	Piggery excreta as manure	2.92	IV
	10**	Feeding method of poultry	2.92	IV
	19**	Fish diseases	2.92	IV
	6*	Marketing of piggery products	2.90	V
	8*	Diseases and Vaccination of poultry	2.90	V
	1*	Prevention of infectious diseases by vaccination or any other methods of piggery	2.88	VI

	9*	Nutrition and Health of poultry	2.88	VI
	3*	Nutrition and health of pig	2.87	VII
	4*	Feeding method of pig	2.87	VII
	21*	Production systems of fishery	2.87	VII
	20*	Fish quality	2.65	VIII
	22*	Fish welfare	2.65	VIII
Training methodology (n = 18)	10**	Using AV aids in time	2.97	I
	4**	Selecting AV aids	2.95	II
	14**	Formulating evaluation performance	2.95	II
	17**	Evaluation report	2.93	III
	11**	Maintaining sequence	2.93	III
	12**	Summarizing the lecture	2.92	IV
	18**	Report preparation	2.92	IV
	5*	Preparation of AV aids (posters, sound system etc.)	2.85	V
	6*	Establishing rapport	2.74	VI
	8*	Presenting the subject	2.70	VII
	13**	Deciding evaluation criteria	2.70	VII
	15*	Recording evaluation data	2.68	VIII
	16*	Procuring and interpretation	2.68	VIII
	1*	Need assessment of the trainees	2.67	IX
	9*	Maintaining eye contact	2.67	IX
	7*	Introducing the topic	2.65	X
	2*	Deciding objectives	2.65	X
	3	Finalizing course content	2.38	XI
Crop demonstration (n = 9)	5**	Using AV aids	2.98	I
	7**	Conduct field day or farmers' day around successful demonstrations	2.95	II
	8**	Motivate farmers to present at the time of final assessment of the result	2.93	III
	9*	Analyzing and interpreting the result	2.75	IV
	3*	Explaining the steps to the farmers	2.70	V
	2*	Explaining objectives	2.68	VI
	1*	Planning demonstration	2.67	VII
	6*	Inform farmers about demonstration	2.65	VIII
	4*	Giving publicity about demonstration	2.60	IX
Report preparation (n = 4)	3**	Keeping of reports	2.95	I
	1**	Preparation of reports	2.92	II
	2*	Compilation of reports	2.68	III
	4*	Reporting to the office concern	2.65	IV
Other areas (IPR, Climate, resilient, Social	5*	Intellectual Property rights and related issues	2.73	I
	6*	Technologies for climate resilient agriculture	2.70	II
	4*	Social forestry programmes	2.68	III

forestry) (n = 7)	7*	Looking after poultry and livestock	2.67	IV
	2*	Filling an application for a patent	2.65	V
	1*	Criteria adopted for grant of a patent to an inventor	2.65	V
	3*	Involvement of common people in social forestry	2.65	V

{A list of all the training items under different areas, with their Training Importance Score (TIS) are given in the Table 3. The items found as 'most important' (>2.91) are shown with double star (**) marks and those which were found to be 'important' (2.60-2.91) are marked with single star (*)}.

Table.4 Area wise distribution of training needs on the basis of ATIS

Sl. No.	Area	ATIS	RANK
1	Plantation crop	2.90	I
2	Animal husbandry	2.90	I
3	Plant pathology	2.80	II
4	Preparation of reports	2.80	II
5	Agricultural engineering	2.78	III
6	Plant breeding	2.78	III
7	Crop demonstration	2.77	IV
8	Entomology	2.75	V
9	Soil science	2.74	VI
10	Agricultural economics	2.72	VII
11	Agricultural extension	2.68	VIII
12	Other areas (IPR, Climate change, social Forestry)	2.68	VIII
13	Agronomy	2.65	IX
14	Nematology	2.63	X
15	Training methodology (Planning, conducting, evaluation *etc*.)	2.62	XI
16	Horticulture	2.60	XII

The important training need areas in order of importance are Plantation crops (2.90), Animal husbandry (2.90), Plant Pathology (2.80), Preparation of reports (2.80), Agricultural Engineering (2.78), plant breeding (2.78), Crop demonstration (2.77), Entomology (2.75), Soil Science (2.74), Agricultural Economics (2.72), Agricultural Extension (2.68), other areas (IPR, Climate change, Social forestry *etc*.) (2.68), Agronomy (2.65), Nematology (2.62) and Horticulture (2.60) (Table 1–4).

Majority of the respondents were having high level of training needs. So adequate trainings should be provided to them by the state department of Agriculture and other training institutes. The areas with highest Training Importance Scores (ATIS) were Plantation crop, Planning, Conducting and Evaluating training, Animal Husbandry and Plant Pathology. Thus, the study stresses the need for organizing training in these areas. The training items with highest TIS like micronutrient problem in acid soils and management, use of organic manure as fertilizer, azolla - it's growth, production and uses, acid soils-fertility management and problems, green manuring, showing of nutrient deficiency symptom, Integrated pest

management, symptoms and control of important diseases of rice, cultivation of rubber and preparation and use of different audio visual aids should be considered while organizing training.

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