



Impact of Capacity Building Programmes on Farmers of Hassan District of Karnataka, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study was conducted in 5 villages of Channarayapattanataluk of Hassan district in Karnataka. The College of Agriculture, Hassan, Karnataka has conducted Rural Agricultural Work Experience Programme for the final year B.Sc (Hons.) Agriculture, B.Tech (Bio Technology) and B.Tech (Food Technology) in those 5 villages during the year 2021-22 for 3 months. The regular capacity building programmes were organized for the farmers by the students in the presence of scientists of the college. During the capacity building programmes such as training, method demonstration, exposure visits etc., the pre and post evaluation was also done to understand the knowledge and skill of the farmers about the bio agents and its application in crop production. The data was

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collected from 100 farmers to assess impact of capacity building programmes on bio agents such as Trichoderma, Pseudomonas, Phosphate Solubilizing Bacteria etc. The study reveals that, majority (78.00%) of the farmers were not aware about the availability of different bio agents in the market, 80.00 per cent of them were unaware about the importance of application of bio agents in crop production, around 89.00 per cent were not having knowledge about use of bio agents in different crops. Nearly 90.00 per cent of farmers were having poor knowledge and skill on how to use the bio agents in crop production practices. After the pre evaluation the different programmes like training programmes about the importance and application of bio agents, skill on demonstration about the bio agents treatment, exposure visits etc., were organized and conducted post evaluation also. The data from the study reveals that, there was increase in the knowledge level and skill in the application of bio agents to an extent of 25 to 30 per cent among the participants. During the year 2022, the study was conducted to assess the adoption level of farmers in the same villages about the importance and application of bio agents in their crop production practices. It was observed that, still farmers were using the bio agents in their farming practices and they were happy to share that, there was a good result in crop yield due to non incidence of pest and diseases and also due to reduced cost of pesticide application.

Keywords: Farmers; knowledge; adoption; bio agents; impact.

1. INTRODUCTION

The term READY refers to “Rural and Entrepreneurship Awareness Development Yojana” and the programme is conceptualized to reorient graduates of Agriculture and allied subjects for ensuring and assuring employability and develop entrepreneurs for emerging knowledge intensive agriculture. Depending on the requirement of respective discipline the components under READY programme are, Experiential Learning, Rural Agricultural Work Experience, In Plant Training/ Industrial attachment, Hands on training (HOT)/ Skill development training and Student Project

Above components are interactive and are conceptualized for building skills in project development and execution, decision-making, individual and team coordination, approach to problem solving, accounting, quality control, marketing and resolving conflicts, etc. with end to end approach.

Bioagents are widely used in agri-horticultural ecosystem as plant protectants which have profound impact on plant community through enhancing plant growth, biotic and abiotic tolerance to host. Biological control is the way of controlling of plant disease by the application of fungi, bacteria, actinomycetes, and viruses (bacteriophages) [1-3]. It has been estimated that rupees 60,000 crores worth of crop are lost each year due to plant diseases. The degree of plant disease control/disease suppression achieved with biological agents can be comparable to that achieved with chemicals [4,5]. In India, the

maximum crop protectants used are insecticides (65%), herbicides (15%), fungicides (15%), and rodenticides or nematocides (4%) but at global level herbicides (45%) are used more followed by fungicides (27%), insecticides (15%), and other chemicals (7%). A. N. Tripathi et al (2020).

1.1 Rural Agricultural Work Experience Programme (RAWEP)

The Rural Agricultural Work Experience Programme (RAWEP) under student READY (Rural and Entrepreneurship Awareness Development Yojana) programme of ICAR provides exposure to agricultural students to the natural setting of the village situations, work with the farm families, identify their problems and make use of various extension tools for transferring the latest agricultural technologies. The students also get opportunity to study the various on-going schemes related to agriculture and rural development and participate in their implementation. The students were given rigorous orientation and familiarization on various issues and problems expected on farmers' field and hence gain competence and confidence for solving problems related to agriculture and allied sciences. It has been implemented in adopted villages under the supervision of scientists. Activities focused on intensive observations/ analysis of socio-economic and technological profile of the farm families in rural areas, participatory extension approach and acquaintance with farming situations, farm practices and interaction with progressive farmers. Soil testing has become the integral part of RAWEP [6,7]. This helps orient our agricultural

graduates for participation in various rural developmental programme. The students also gained first hand information on industries during attachment with identified agro based industries. The timing for RAWEP can be flexible for specific regions to coincide the main cropping season.

Capacity Building can be defined as "activities which strengthen the knowledge, abilities, skills and behaviour of individuals can efficiently meet the goals in a sustainable way. Training is one of the essential components of capacity building. Training has become an inseparable part of HRD. It has become one of the components, which enables any farmers to churn out as the most productive and most suitable ones for farming activities [8,9].

The various capacity building programmes were organized for the farmers by the students in the presence of scientists of the Institutions. During the capacity building programmes such as trainings, method demonstration, exposure visits etc were also organized to enhance the skill and knowledge component of farmers.

2. METHODOLOGY

The college of Agriculture, Hassan, Karnataka, implemented RAWEP for the final year 102 B.Sc (Hons.) Agriculture, 62 B.Tech (Bio Technology) and 60 B.Tech (Food Technology) students in 5 villages of Channarayapattana Taluk of Hassan district, Karnataka during the year 2021-22 for a period of 3 months. During the programme the students were organized 192 capacity building programmes such as training, awareness programmes, method demonstrations, result demonstrations, diagnostic field visits, field days etc., about the technologies released by University of Agricultural Sciences, Bangalore and other institutions in the presence of scientists of our college in the villages and farmers field on major crops.

Around 19 programmes were organized on Bio agents application in the major crops of the area. Bio agents such as Trichoderma, Azospirillum, Phosphate Solubilizing Bacteria, Pheromone traps etc., were used to show their importance and application in crop production practices through method demonstration on seed treatment, seedlings treatment, soil application etc., result demonstration etc.,

Assessment of impact of capacity building programmes organized on bio agents application during the RAWEP was done during the year 2022. The data was collected from 100 purposefully selected farmers who were the participants of the earlier capacity building programmes and growing major crops such as red gram, maize, coconut, tomato and brinjal. Impact was assessed in 4 dimensions such as, change in knowledge, level of adoption, change in yield and income of farmers in above mentioned crops. The data was collected by using pre tested schedule and analysed with suitable statistical tools such as frequency and percentage.

3. RESULTS AND DISCUSSION

The data in the Table 1 reveals the level of knowledge of farmers before and after the capacity building programmes. It shows that, before organizing the capacity building programmes about 80.00 per cent of farmers were not aware about the importance of the bio agents in crop production practices, majority (78.00%) of the farmers were not aware about the availability of different bio agents in the market, nearly 87.00 per cent of them are unaware about the sources of availability of bio agents, majority (92.00%) of the participants were faced difficulties in differentiating bio agents and chemical agents in crop production practices, about 89.00 per cent of the farmers were not having knowledge on which crops bio agents are recommended and 98.00 per cent of them were not aware about the recommended dosage of bio agents in crop production practices and 90.00 per cent of them were not having knowledge on method of application of bio agents in crop production practices.

After the capacity building programmes on application of bio agents in crop production practices, majority of the farmers were well aware about the importance, its application, dosage, recommendation to specific crops and its method of application.

Data in the Table 2 indicates the level of adoption of bio agents in crop production practices by the participants of the capacity building programmes. It reveals that, even though good number of participants were well aware about the bio agents and its application in crop production practices after capacity building programmes, only 22.00 per cent of them completely adopted bio agents in crop

production, 17.00 per cent of them had adopted recommended dosage, nearly 14.00 percentage of them adopted completely in specified crops and only 21.00 per cent completely adopted recommended method of application of bio agents such as, seed treatment, seedlings treatment or soil application etc., Majority of the farmers were fall in the category of partial adoption level of bio agents, it might be shows that, they adopted less or high level of bio agents in terms of quantity or dosage, some might be adopted in early periods and discontinued in later stage of crop production.

Table 3 data indicates the change in level of yield and income of farmers who had knowledge on bio agents application and adopted completely or partially in their crop production practices. Data was collected from 72 farmers, those were completely or partially adopted the bio agents in major crops of the area such as red gram, tomato, brinjal, maize and coconut. It shows that, there was an increase in 12.50 per cent of yield

and income of red garm growers after the adoption of bio agents in their crop production practices. Nearly 6.00 per cent by tomato growers, around 10.00 per cent by brinjal growers, 7.70 per cent by maize growers and about 19.40 per cent by coconut growers of the area experienced increased yield and income due to adoption of bio agents in crop production practices.

Table 4 data reveals the constraints faced by farmers for non adoption of bio agents in crop production. Majority of them opined that, they were not aware about the bio agents availability in the market and it stands first rank followed by Poor Skill on application of bio agents in crop production, Non availability of bio agents near to their villages, Misunderstanding of high price of bio agents, low shelf life of bio agents, less number of capacity building programmes on use of bio agents, and poor government support were the other constraints faced by farmers.

Table 1. Knowledge level of farmers on bio agents (n=100)

Sl. No.	Statements	Response			
		Before		After	
		Yes	No	Yes	No
1	Do you know the importance of bio agents in crop production practices	20 (20.00%)	80 (80.00%)	58 (58.00%)	42 (42.00%)
2	Have you aware about the availability of bio agents in market	22 (22.00%)	78 (78.00%)	87 (87.00%)	13 (13.00%)
3	Do you know the sources of availability of bio agents	13 (13.00%)	87 (87.00%)	89 (89.00%)	11 (11.00%)
4	Can you differentiate bio agents and chemical agents in crop production	8 (8.00%)	92 (92.00%)	88 (88.00%)	12 (12.00%)
5	Do you know about the Recommendation of bio agents to particular crops	11 (11.00%)	89 (89.00%)	72 (72.00%)	28 (28.00%)
6	Do you know about the Recommendation in terms of quantity of bio agents	2 (2.00%)	98 (98.00%)	81 (81.00%)	19 (19.00%)
7	Do you know the method of application of bio agents in crop production practices	10 (10.00%)	90 (90.00%)	67 (67.00%)	33 (33.00%)

Table 2. Adoption level of bio agents by the farmers (n=100)

Sl. No.	Statements	Response		
		Full adoption	Partial adoption	No adoption
1	Application of bio agents in crop production	22 (22.00%)	50 (50.00%)	28 (28.00%)
2	Application of recommended dosage of bio agents	17 (17.00%)	55 (55.00%)	28 (18.00%)
3	Application of bio agents to specified crops	14 (14.00%)	58 (58.00%)	28 (28.00%)
4	Recommended method of application of bio agents	21 (21.00%)	51 (51.00%)	28 (28.00%)

Table 3. Change in yield & Income level (n=72)

Sl. No.	Statements	Response (yield)			Response (income)		
		Before	After	% Change	Before	After	% Change
1.	Change in Yield of Red Gram	4.00 qtl./acre	4.50 qtl./acre	12.50	32,000.00 (@8000 Rs. Per qtl)	36,000.00	12.50
2.	Change in Yield level of Tomato	25.00 (ton/acre)	26.50 (ton/acre)	06.00	1,75,00.00 (@7000 Rs. Per ton)	1,85,500.00	6.00
3.	Change in yield of Brinjal	20.00 (ton/acre)	22.00 (ton/acre)	10.00	1,80,000.00 (@9000 Rs. Per ton)	1,98,000.00	10.00
4.	Change in yield of Maize	26.00 (qtl./acre)	28.00 (qtl./acre)	07.70	54,600.00 (@2100 Rs. Per qtl)	58,800.00	7.70
5.	Change in yield of Coconut	134.00 Nut / palm	160.00 Nut / palm	19.40	1608.00 (@12 Rs. Per nut)	1920.00	19.40

Table 4. Constraints faced by farmers for adoption of bio agents (n=100)

Sl. No	Statements	Rank
1	Not aware about the availability of bio agents	I
2	Poor Skill on application of bio agents in crop production	II
3	Non availability of bio agents near to their villages	III
4	Misunderstanding of high price of bio agents	IV
5	Enhancing the Shelf life of bio agents	V
6	Capacity building programmes	VI
7	Poor government support	VII

Table 5. Suggestions of farmers for adoption of bio agents (n=100)

Sl. No	Statements	Ranks
1	Easy accessibility of bio agents	I
2	Capacity building programmes on application of bio agents in crop production	II
3	Government support	III
4	Regular visit of extension functionaries to farmers field	IV
5	Increase the shelf life of bio agents	V
6	Proper guidance by Extension Functionaries	VI
7	Ease of application	VII

The respondents were also provided some of the suggestions for complete adoption of bio agents in crop production and it is presented in Table 5 and they are make the easy accessibility of bio agents to farming community stands first and followed by need of more number of Capacity building programmes on application of bio agents in crop production, maximum support of government, Regular visit of extension functionaries to farmers field, need to enhance the shelf life of bio agents, Proper guidance by Extension Functionaries and ease of application of bio agents compare to complexity in its application.

4. CONCLUSION

From the study it clearly shows that, farmers are willing to apply the bio agents in their regular crop production practices if the government and other institutions provides the regular and rigorous capacity building programmes on application of bio agents in crop production practices especially in the Integrated pest and disease management activities along with government support in terms of subsidies and other incentives to the farmers who are involved in application of bio agents in their farming.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Seyyed Ali NoorhosseiniNiyaki, Rouhollah Radjabi, Mohammad Sadegh Allahyari. Social factors critical for adoption of biological control agents *Trichogramma Spp.* egg parasitoid of rice stem borer *chilosuppressalis* in North of Iran. *American-Eurasian J. Agric. & Environ. Sci.* 2010;9(2):133-139.
2. Tripathi N, Meena BR, Pandey KK, Singh J. Microbial bioagents in agriculture: Current status and prospects. *New Frontiers in Stress Management for Durable Agriculture.* 2020:331–368.
3. Available:<https://www.nbair.res.in/sites/default/files/left%20menu/services/Research%20Services/compendium%20of%20insect%20bioagents%20NBAll.pdf>
4. Kalimba UB, Culas RJ. Climate change and farmers' adaptation: Extension and capacity building of smallholder farmers in Sub-Saharan Africa. *Global Climate Change and Environmental Policy: Agriculture Perspectives.* 2020:379-410.
5. Sajeev MV, Singha AK. Capacity building through KVKs: training needs analysis of farmers of Arunachal Pradesh. *Indian Research Journal of Extension Education.* 2016 Jan 16;10(1):83-90.
6. Muhammad Mubushar, Fahad O. Aldosari, Mirza B. Baig, Bader M. Alotaibi, Abdul Qader Khan. Assessment of farmers on their knowledge regarding pesticide usage and biosafety. *Saudi Journal of Biological Sciences.* 2019;26(7): 1903-1910.
7. Anand Kumar Pathak, Kevin Christopher. Study of socio-economic condition and constraints faced by the farmers in adoption of Bio fertilizer in Bhadohi district (Uttar Pradesh). *Journal of Pharmacognosy and Phytochemistry.* 2019;8(2).
8. Minnikanti Venkata Satya Sai G, Devi Revati, Ramya R, Ann Mary Swaroop, et al. Knowledge and perception of farmers regarding pesticide usage in a rural farming village, Southern India. *Indian J Occup Environ Med.* 2019;23(1):32–36.
9. Anna Maria Pirttilä, et al. Koskimäki biofertilizers and biocontrol agents for agriculture: How to identify and develop new potent microbial strains and traits. *Microorganisms.* 2021;9(4):817.

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