

## RESEARCH NOTE

## Training Needs of African Professionals towards Horticulture Production Technology

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### ABSTRACT

*African economies are growing fast and the prevailing demand for food and nutritional security in African countries necessitates promotion of horticulture sector in a planned manner. India is one among the progressive countries as far as horticulture development is concerned and hence have the potential to train the professionals from African countries, so that such professionals can contribute towards development of horticulture in Africa. In order to plan need-based training programmes pertaining to horticulture for the professionals serving in African countries, a survey was conducted among agricultural professionals (31) from Kenya, Malawi and Liberia. This paper discusses about the training needs of such professionals towards advanced production technologies of vegetables, fruits, ornamental and plantation crops and protected cultivation of horticulture crops.*

**Keywords:** Training needs; Kenya; Malawi; Liberia; Horticulture;

The changing scenario in global agriculture, related economy and communication has resulted in ever increasing needs for improving the knowledge and skills of extension personnel. The first step in improving the skills of extension personnel would be to assess their training needs, so that need-based training and capacity building programmes can be organized to address their capacity needs. India is one of the country wherein the horticulture sector has been progressive. That way, India has the potential to build the capacity of stakeholders of other countries that are emerging in horticultural sector, especially African countries.

FAO estimates that by 2020, 24 of the world's 30 fastest growing cities will be in Africa (FAO, 2012). Within 18 years, the urban population of sub-Saharan Africa will double to almost 600 million. Around 74 million jobs will need to be created in Africa over the current decade to prevent youth unemployment from rising (FAO, 2012). Horticulture generates local employment, promotes entrepreneurship, reduces food transport costs

and pollution, creates urban green belts, and recycles urban waste as a productive resource (FAO, 2012).

The proportion of undernourished people in Africa is 21 per cent and 23.8 per cent in sub-Saharan Africa. Sub-Saharan Africa has more than a quarter of the world's undernourished people, owing to an increase of 38 million since 1990–92 (FAO, IFAD and WFP, 2014). The first status report on urban and peri-urban horticulture in Africa (FAO, 2012) describes how commercial production of fruit and vegetables provides livelihoods for thousands of urban Africans and food for millions more. Eating at least 400 g of fresh fruits and vegetables a day helps to alleviate micronutrient deficiencies and to prevent chronic diseases associated with unhealthy urban diets and lifestyles (WHO, 2004).

About 50.6 per cent of the Kenyan population lack access to adequate food, which is more severe in the arid and semi-arid lands. Here, the horticulture subsector is the third most important foreign exchange earner after coffee and tea and is often viewed as a growth engine of

the economy. Horticulture will contribute to achievement of core Millennium Development Goals (MDG) objectives of poverty alleviation and sustainable development and promoting gender equality and empowerment of women through their involvement in project activities. Hence, the agricultural professionals in Kenya are to be trained in horticulture sector, so that they can contribute for the development of this sector in Kenya.

Horticulture in Malawi has several components/sub-sections amongst which are fruits, vegetables, ornamental/cut- flowers, tree nuts, spices and herbs. The horticulture sector in general has the potential to complement the country's traditional cash crops of tobacco, tea and sugar in terms of contribution to national economy. Statistics from the Ministry of Economic Planning and Development (MEPD) indicate that on average, the horticulture sector contributes about 22 per cent to the national Gross Domestic Product (GDP) and about 58 per cent within the agricultural sector (*Kachule R and Franzel S 2009*). To improve this sector in Malawi, there is need for training the agricultural professionals.

The Agriculture programme is the largest sector of the Liberian economy, making up over half of all economic activities and is the most important source of income for women. Vegetable production can be profitable for smallholders in Liberia. During Liberia's dry season, local production of vegetables plummets, demand is met by a spike in imports—especially from Guinea, Sierra Leone, and Cote d'Ivoire—and prices soar. Market prices for many vegetables, including chili peppers, tomatoes, "bitter ball," eggplant, okra, and cabbage, are two to five times higher than during the rainy season. This represents a significant opportunity for local farmers who can fulfill dry-season demand. Vegetable production for commercial sales can be a profitable commercial activity for small farmers, especially if simple, affordable, and effective irrigation systems can be developed and delivered (*Anonymous, 2015*).

All the above mentioned facts imply that the horticulture sub-sector in Africa needs adequate attention and facilitation. Training the agricultural professionals of Africa on various aspects of advances in horticultural production technology, will be one of such strategies, so that the trained professionals may contribute to horticulture development through training farmers of Africa and disseminating them the relevant information

through various modes. In this regard, to assess the training needs of agricultural professionals in horticulture sector, a survey was conducted. The survey was conducted among the African delegates (31) from Kenya, Malawi and Liberia at ICAR-Indian Institute of Horticultural Research (IIHR), Bengaluru in August, 2015 as part of their study-cum-exposure visit during August 10-13, 2015. These delegates represented Ministry of Agriculture and Allied Departments, Agricultural Universities, Private Sector and Non-Governmental Organizations (NGOs) of Kenya, Malawi and Liberia.

This paper presents the training needs of agricultural professionals of African countries, especially Kenya, Malawi and Liberia towards horticultural production technology.

## METHODOLOGY

The African delegates visited ICAR-IIHR in a study-cum-exposure visit as part of their fourth Indo-US-African Triangular International Training Programme on 'New Dimensions in Extension Management' organized by National Institute for Agricultural Extension Management (MANAGE), Hyderabad from July 16 to September 13, 2015. During the study-cum-exposure visit, the delegates were sensitized about need-based advanced horticultural production technologies such as integrated crop management of fruit crops, vegetables crops, ornamental crops, medicinal and aromatic plants, integrated nutrient management in horticulture, conservation horticulture, climate resilient horticultural technologies, integrated pest and disease management in horticultural crops, protected cultivation, post-harvest management of horticultural crops, mechanization in horticulture, mushroom production technology and transfer of horticultural production technologies to farmers and the industry. The sensitization of horticultural production technologies to the African delegates was done through panel discussion between scientists and delegates, visits to laboratories, experimental and demonstration plots and private horticulture nurseries. The delegates responded at the end of the programme that they had learnt many production technologies, which they can either implement or disseminate at their back-home situations.

To assess the training needs of the delegates, a questionnaire was constructed. The questionnaire had four different parts. First three parts pertained to the

response of the delegates about training needs in vegetable, ornamental and medicinal crops; fruits and plantation crops and protected cultivation of vegetable and ornamental crops. The fourth one was an open-ended question about their training needs which were not included in the first three parts. The first part had 10 items (Table 1), the second had 8 items (Table 2), whereas the third one had 17 items (Table 3). The response of the delegates in each item of the first three parts were obtained against a three-point continuum namely most important, important and least important with a score of 3, 2 and 1 respectively. The response of the delegated were analyzed using descriptive statistics.

## RESULTS AND DISCUSSION

Post harvest and value addition, integrated disease management, integrated pest management, integrated nutrient management, marketing of produce, nursery management, packaging of produce, raising of seedlings, land preparation and transplanting were the items against

which the delegates recorded their training needs pertaining to vegetable, ornamental and medicinal crops (Table 1). The average score of the training needs of each item has been given in Table 1 and the overall average was 2.47. Considering the overall average, post harvest and value addition, integrated disease management, integrated pest management, integrated nutrient management, marketing of produce were the items that had average score above the overall average. Hence, while designing the course module, such topics that are to be given preference for the delegates from Kenya, Malawi and Liberia.

A glance at Table 2 informs that pest management, disease management, post harvest and value addition, marketing of produce, integrated nutrient management, packaging of produce, canopy architecture and orchard management were the items against which the delegates recorded their training needs pertaining to fruits and plantation crops (Table 2). The average score of the training needs of each item has been given in Table 2

**Table 1. Training needs of African delegates in vegetable, ornamental and medicinal crops (N=31)**

Item	Most important		Important		Least important		Score
	No.	%	No.	%	No.	%	
Post harvest and value addition	25	81	6	19	0	00	2.81
Integrated disease management	24	77	7	23	0	00	2.77
Integrated pest management	23	74	8	26	0	00	2.74
Integrated nutrient management	20	65	9	29	2	06	2.58
Marketing of produce	18	58	11	35.5	2	6.5	2.52
Nursery management	17	55	10	32	4	13	2.42
Packaging of produce	15	48	13	42	3	10	2.39
Raising of seedlings	14	45	12	39	5	16	2.29
Land preparation	12	39	14	45	5	16	2.23
Transplanting	9	29	12	39	10	32	1.97
Overall average	2.47						

**Table 2. Training needs of African delegates in fruit and plantation crops**

Item	Most important		Important		Least important		Score
	No.	%	No.	%	No.	%	
Pest management	22	71	8	26	1	03	2.68
Disease management	21	68	9	29	1	23	2.65
Post harvest and value addition	21	68	7	23	3	10	2.58
Marketing of produce	20	65	9	29	2	06	2.58
Integrated nutrient management	18	58	12	39	1	03	2.55
Packaging of produce	19	61	10	32	2	06	2.55
Canopy architecture	14	45	13	42	4	13	2.32
Orchard management	12	39	13	42	6	19	2.19
Overall average	2.51						

**Table 3. Training needs of African delegates in protected cultivation of vegetable and ornamental crops**

Item	Most important		Important		Least important		Score
	No.	%	No.	%	No.	%	
Insect and disease control	24	77	12	39	2	06	2.71
Vegetable harvesting, preservation and marketing	21	68	13	42	2	06	2.61
Selection of quality seed and seedlings	19	61	10	32	2	06	2.55
Nutrient management (dosage, timing)	20	65	8	16	3	10	2.55
Knowledge on type of mulching	18	58	11	35	2	06	2.52
Seed bed preparation, seed sowing and seedling raising	17	55	11	35	3	10	2.45
Soil and fertilizer management	17	55	11	35	3	10	2.45
Land preparation and seedling transplantation	16	52	11	35	4	13	2.39
Design of polyhouse/green house/shade net structure	16	52	11	35	4	13	2.39
Irrigation and drainage management	16	52	10	26	5	16	2.35
Knowledge on right shade nets and nylon meshes	16	52	10	32	5	16	2.35
Fabrication and erection of structure	16	52	10	32	5	16	2.35
Design structures for different geographical locations	15	48	11	35	5	16	2.32
Seed production	17	55	8	26	4	13	2.29
Vector management	14	45	13	42	5	16	2.29
Intercultural operation	13	42	8	26	5	16	2.26
Choice of crop for optimum income	13	42	11	35	5	16	2.26
Overall average							2.41

and the overall average was 2.51. Considering the overall average, pest management, disease management, post harvest and value addition, marketing of produce were the items that had average score above the overall average. Hence, these are the topics that are to be given preference, while designing the course module on fruits and plantation crops for the delegates from Kenya, Malawi and Liberia.

Insect and disease control, vegetable harvesting, preservation and marketing, selection of quality seeds and seedlings, nutrient management (dosage, timing), knowledge on type of mulching (reflective/non-reflective/biodegradable/non biodegradable), seed bed preparation, seed sowing and seedling raising, soil and fertilizer management, land preparation and seedling transplantation, design of polyhouse/green house/shade net structure, irrigation and drainage management, knowledge on right shade nets and nylon meshes, fabrication and erection of structures, design structures for different geographical locations, seed production, vector management, intercultural operation and choice of crop for optimum income were the items against which the delegates recorded their training needs (Table 3). The average score of the training needs of each item has been given in Table 3 and the overall average was 2.41. Considering the overall average, insect and

disease control, vegetable harvesting, preservation and marketing, selection of quality seed and seedlings, nutrient management (dosage, timing), knowledge on type of mulching (reflective/non-reflective/biodegradable/non biodegradable), seed bed preparation, seed sowing and seedling raising, soil and fertilizer management were the items that had average score above the overall average. Hence, preference may be given for such topics, while designing the course module on protected cultivation of vegetables and ornamental crops for the delegates from Kenya, Malawi and Liberia.

## CONCLUSION

The survey conducted at ICAR-IIHR among the delegates of Kenya, Malawi and Liberia to assess their training needs towards horticulture production technology revealed that post harvest and value addition, integrated disease management, integrated pest management, integrated nutrient management, marketing of produce were the important training needs pertaining to cultivation of vegetable ornamental and medicinal crops. Similarly, pest management, disease management, post harvest and value addition, marketing of produce were the major training needs pertaining to fruits and plantation crops, while insect and disease control, vegetable harvesting, preservation and

marketing, selection of quality seed and seedlings, nutrient management (dosage, timing), knowledge on type of mulching (reflective/non-reflective/biodegradable/non biodegradable), seed bed preparation, seed sowing and seedling raising, soil and fertilizer

management were the major training needs pertaining to protected cultivation of vegetable and ornamental crops. Hence, preferences should be given for these topics while designing course modules for professionals of Kenya, Malawi and Liberia.

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