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Technology need analysis in characterization of dominant crops and animal husbandry specialized homegardens

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Abstract
Home gardens are the primitive forms of agriculture and with the current issues of rising population, lack of resources and food crisis, they can ensure people with better livelihoods. Home gardens can accomplish sustainability in terms of appropriate technology need analyzis and proper interventions with specialized components. The study was conducted in the Thiruvananthapuram district comprising five agro ecological units with sixty specialized homegarden systems The need for value addition technologies (1.93) were more when compared to production (2.58) and protection (2.23) in dominant crops. Similarly in animal husbandry components, technologies related to goat (2.00) were unavailable when compared to cow (2.67) and poultry (2.50).

Keywords: Home gardens, specialized homegarden systems, technology need analysis

Introduction
To make homegardens more remunerative and as a strategy to mitigate risks, diversification is the best choice. The presence of different functional groups of crops, trees and livestock in homegarden systems fulfils the dietary and cash requirements of the households, thus enhancing food and livelihood security (Tesfaye, 2005) [4]. Considering the potential benefits and technological potential of agricultural diversification, a better understanding of the factors controlling the diversification needs to be defined. McGraw (1982) [3] defined technology as systematic knowledge and action, usually of industrial processes, but applicable to any recurrent activity.
The functional dynamics and the economic entities in the homegarden as a result of value addition or product diversification is shown by means of vertical diversification (Aravind *et al*., 2004) [1]. Studies reveal that the diversity of crops that results in specialisations with primary homegarden components along with vegetation, livestock, fisheries and other specialised components enables continuous produces/products and reduces the production risks. Altieri and Anderson (1986) [2] revealed that for accelerating moderate to high level food production, indigenous technology should be integrated with technology development for resource poor families.

Materials And Methods
'Ex-post-facto' and 'explorative' research designs were used for conducting this study. The study was conducted in the Thiruvananthapuram district comprising five agro ecological units where the specialized homegarden systems are in vogue. The agro ecological units were selected in consultation with Kerala Agricultural University and State Planning Board. It includes AEU-1, AEU-8, AEU-9, AEU-12 and AEU-14. From each AEU, one panchayat each was selected randomly in consultation with Agricultural Officers. The panchayats include Kazhakkuttam, Pallichal, Nedumangad, Amburi and Aryanad. From each panchayat 12 specialised homegardens were selected using Simple Random Sampling, thus making a total of 60 specialised homegardens.
The technology needs assessment were worked out using score/rank given below:

Score/Rank Criteria
0. Technology not available (most needed)
1. Technology available but not applicable
2. Technology available but not sustainable
3. Technology available, applicable and sustainable

The technology needs of farmers vary according to the specialisations they incorporate, the managerial levels in which they operate, the deficits in the demand and supply of the specialised components they raise with reference to the specificities of the land they engages for raising. Technology was assessed for each specialization *viz.* dominant crops and animal husbandry components. Thus technology needs scores for dominant crops of all the 60 farmers of the Thiruvanathapuram district were tabulated and subjected to statistical analysis. The scores assigned being in ordinal scale, the non-parametric test of analysis of variance (chi-square test) was administered to assess the need disparities. The technology needs were further tabulated for analysis. Further mean technology need score was taken for each specialization. The parameter with minimum score was considered as most needed technology in specialized homegardens.

Results And Discussions

Technology needs (gaps) for production, protection and value addition aspects for dominant crop specialisations.

Table 1: Technology needs for dominant crop specialisations in terms of production, protection and value-addition aspects.

	AEU 1	AEU8	AEU9	AEU 12	AEU14	Total N=60
Dominant crops- Production						
Technology not available (0)	1	0	0	0	0	1
Technology available but not applicable (1)	0	1	0	0	0	1
Technology available but not sustainable (2)	3	5	5	1	5	19
Technology available,applicable and sustainable (3)	8	6	7	11	7	39
Expected score range : 0-180 Data score range : 0-117						
Protection						
Technology available but not applicable (1)	4	3	7	4	5	23
Technology available,applicable and sustainable (3)	8	9	5	8	7	37
Expected score range :0-180 Data score range: 0-134						
Value addition						
Technology not available (0)	2	3	4	2	4	15
Technology available but not applicable (1)	1	1	2	1	1	6
Technology available but not sustainable (2)	1	1	1	1	3	7
Technology available, applicable and sustainable (3)	8	7	5	8	4	32
Expected score range : 0-180 Data score range: 0-116						

It was evident from Table 1 that majority (39) of the respondents were falling under the category "technology available, applicable and sustainable" for production related aspects irrespective of AEU. The data subjected to chi square test revealed that ($\chi 2$=0.284) home garden respondents were having adequate availability of technology towards the production aspects in dominant crops. For protection related aspects, the majority (37) of respondents unequivocally opined that technology needs were perceived to be sustainable, applicable as well as available. However the applicability of technology was a high matter of concern fo rmore than one-third (23) of the respondents. The chi square test revealed that ($\chi 2$=0.594) home garden respondents are having necessary technology related to protection process. This was because of the safe to eat food concept has taken away the minds of farmers to draw attention towards the protection related aspects. For value addition technologies majority of respondents (32) were having adequate technology needs but availability was a major concern expressed by fifteen farmers. The chi square test administered revealed that ($\chi 2$=0.060) home garden respondents required more technologies for value addition and that too specific for each specialisations. However necessary technology needs to be delivered to safeguard the quality of food keeping in mind and provision of the avenues for value addition.

Technology needs (gaps) for animal husbandry components

Table 2: Technology needs of animal husbandry components

Category	Frequency	Technology need Score for AEUs together	Expected score range
Specialisation- Cow, N=3			
Technology not available (0)	0	0	0-9
Technology available but not applicable (1)	0	0	
Technology available, but not sustainable (2)	1	2	
Technology available, applicable and sustainable (3)	2	6	
Specialisation-Goat, N=1			
Technology available, but not sustainable (2)	1	2	0-3
Specialisation-Poultry, N=4			
Technology not available (0)	1	0	0-12
Technology available but not applicable (1)	0	0	
Technology available, but not sustainable (2)	2	4	
Technology available, applicable and sustainable (3)	2	6	
Specialisation-Other animal husbandry components, N=6			
Technology not available (0)	0	0	0-18
Technology available but not applicable (1)	0	0	
Technology available, but not sustainable (2)	3	6	
Technology available, applicable and sustainable(3)	3	9	

It was evident from Table 2 that for specialized home gardens with cow as specialization, two out of three respondents perceived that technology was available, applicable and sustainable. However one respondent perceived that even though technology was available, it was not sustainable. Similar was the opinion of the one farmer who was involved in goat rearing. For poultry components, the technology need score was six indicating technology was available, applicable and sustainable. At the same time other half of home garden farmers with poultry as specialization opined technology was available but not sustainable. For the other animal husbandry components in the specialized home gardens the distribution of scores shows symmetry pattern by 50 per cent respondents opining that technology was available, applicable sustainable and another 50 per cent opining it was available but not sustainable.

Conclusion

Technology need analysis using chi square analysis it was inferred that among the home garden respondents all of them had the same levels of technology needs over the dominant crop as specialised component with regard to production, protection and value addition. The need for value addition technologies (1.93) were more when compared to production (2.58) and protection (2.23) in dominant crops. Similarly in animal husbandry components, technologies related to goat (2.00) were unavailable when compared to cow (2.67) and poultry (2.50).

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