Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(6): 2394-2399
Received: 22-09-2018
Accepted: 24-10-2018

PK Sethy
College of Forestry, OUAT, Bhubaneswar, Odisha, India

A Nandi
Dept. of Vegetable Science, OUAT, Bhubaneswar, Odisha, India

SP Mishra
Krishi Vigyan Kendra, Jagatsingpur, Odisha, India

AK Padhiary
Krishi Vigyan Kendra, RRTTS Campus (OUAT) Chiplima, Sambalpur, Odisha, India

A Patnaik
Dept. of Vegetable Science, OUAT, Bhubaneswar, Odisha, India

Correspondence
SP Mishra
Krishi Vigyan Kendra, Jagatsingpur, Odisha, India

Comparative study on production of vegetable crops in homestead agroforestry

PK Sethy, A Nandi, SP Mishra, AK Padhiary and A Patnaik

Abstract
A survey was conducted in three blocks of Kendrapada district about the homestead agroforestry system to compare productivity of vegetable crops in that system with respect to the productivity of recommended practices. It was found that chilli growing homestead farmers were using 20% less quantity of seeds as compared to the recommendation. It was found that okra growing homestead farmers were using 20% more quantity of seeds as compared to the recommendation (Table 4.12.4). It was also found that about 16.33% farmers were using Gromor+FYM, 33.33% farmers were using FYM+Urea and 50% farmers were using DAP+Urea as a source of fertilizer. The fertilizer dose was found to be 38kg N, 25kg P_2O_5 and 0kg K_2O per hectare which is an imbalanced fertilizer dose. The similar type of non-recommended practices of production were being adopted in cucumber, bitter gourd, ridge gourd, pumkin, turmeric, basella crop also.

Keywords: Production, vegetable, homestead agroforestry

Introduction
A typical homestead in India provides an excellent opportunity for a number of economic activities to be undertaken in and around it. The homestead enterprises such as vegetables and fruits cultivation, fish culture, forest and poultry rearing can ensure stability of farm income by offering scope of producing those items, which have less risk. These potential enterprises can contribute to have increased food availability and generate income of the rural farm families (Mazher, 1996). Homestead agroforestry is the most productive and so far the most successful type of agroforestry in the country. Though different types of forestry projects such as agroforestry, community forestry, social forestry, farm forestry etc. have already been under taken by the government for increasing forest area little has been done for the improvement of homestead agroforestry. Researchers from across the world have explored the quantitative status of homestead agroforestry but not the driving factors which lead people to plant trees in their house premises. Odisha state in eastern coast of India is well known for the abundance and diversity of homestead agroforestry systems. The high level ecological and socioeconomic sustainability values and role in livelihood security of rural farmers through home gardens in the state Odisha offers a good opportunity to study the development trends of homestead agroforestry systems. 'Bari' (backyard) farming is a common practice in Odisha. 'Ghara' (house) is incomplete without 'bari' (backyard). Like other areas, Kendrapara district comprises of many home gardens or common backyard or homestead agroforestry systems. The practice of common backyards or home gardening is widespread in the different communities of coastal Odisha comprising of different tree or fruit species like *Mangifera indica*, *Musa paradisiaca*, *Cocos nucifera*, *Artocarpus heterophyllus*, *Psidium guajava*, *Carica papaya* along with different types of vegetables like brinjal, aroids, okra, bitter gourd, drumstick and fodder trees like *Leucaena leucocephala*, *Acacia nilotica*, etc., other different enterprises like fish and poultry rearing, mushroom cultivation are also being done. These potential enterprises contribute to increased food availability and generation of income for the livelihood support of farmers.

Materials method
Odisha is located between 17^0 49' N to 22^0 34'North latitudes and from 81^0 27' E to 87^0 29' East longitude on the eastern coasts of India. It is bounded by the states of West Bengal on the North-East, Jharkhand on the North, Chhattisgarh on the West, Andhra Pradesh on the South and Bay of Bengal on the east. It spreads over an area of 1,55,707 sq. Km (4.74% of India's total area) and has a coastline of about 529 Km. Kendrapara District lies in 20 degree 20' N to 20 degree 37' N Latitude and 86 degree 14' E to 87 degree 01' E Longitude. The Coastline of Kendrapara District covers 48 Km stretching from Dhamra Muhan to Batighar.

Its bioclimatology is much influenced for the short radial distance from the Bay of Bengal. In this study the preference for vegetables are recorded. The criteria are fixed for all the vegetable species. Score was given against the entire criterion. The score 1 represented the most preferred and 4 represented the 4th most preferred species.

Method of data collection

The study is conducted for field-level primary data and researcher himself collected data required for the study. There are three main methods by which farm survey data are gathered. These are (i) direct observation, (ii) interviewing farmers, (iii) record kept by farmers. Data were collected through field visits in the study area and personally interviewing with the sample farmers. Interviews were normally conducted in farmer's house in their leisure time and even in the homesteads when they worked in the plots. They provided information from their memory. In order to minimize the response error, question were asked in simple Odia. After completion of each interview, each interview schedule is checked and noted properly.

Data processing and analysis

After completion of field survey data from all the interview schedules are coded, compiled, tabulated and analyzed in accordance with the objective of study. In the process, all the responses in the interview schedule are given numerical coded value. Local units were converted into standard and quantitative data were converted into quantitative ones by means of suitable scoring whenever necessary. The responses to the question in the interview schedules are transferred to a master sheet to facilitate tabulation. For describing the different characteristics and their constraint facing, the respondents were classified into several categories. These categories were developed by considering the nature of distribution of data, general understanding prevailing in the social system and possible score system. Descriptive analysis such as range, number and percentage, mean standard deviation and rank order were used whenever possible.

Okra

It was found that okra growing homestead farmers were using 20% more quantity of seeds as compared to the recommendation (Table 1). It was also found that about 16.33% farmers were using Gromor+FYM, 33.33% farmers were using FYM+Urea and 50% farmers were using DAP+Urea as a source of fertilizer. The fertilizer dose was found to be 38kg N, 25kg P_2O_5 and 0kg K_2O per hectare which is an imbalanced fertilizer dose. About 50%, 33.33% and 16.66% farmers were using Shakti JK, Utkal Gourav and Parbanikranti respectively as seeds for cultivation of okra. Farmers were using seeds which were 20% costlier than the recommended seed cost. The yield was 23% to 33% lesser as compared to the expected yield. For disease control measure, 83.33% farmers were using chemicals, like Tozin, Sonata and 16.66% were not using any fungicide. For pest control measure, 50% farmers were using pesticides, but they didn't know the name of pesticides and 50% were not using any pesticides. The cost of cultivation was 14% lesser than the expected cost of cultivation.

Table 1: Performance of okra in homestead agroforestry

Okra	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	10Kg/ha.	12Kg/ha.		+20%
2.Source of fertilizer	Urea, DAP/SSP, MOP	Urea+DAP	50	Imbalanced application of fertilizer.
		Urea+FYM	33.33	Imbalanced application of fertilizer.
		Gromor+FYM	16.66	Imbalanced application of fertilizer.
3.Fertilizer dose	80kg.- N/ha	38Kg- N/ha		Imbalanced fertilizer dose.
	40Kg- P_2O_5/ha	25Kg- P_2O_5/ha		
	40Kg- K_2O/ha	0Kg- K_2O/ha		
4.Varieties/hybrids	Pusa A- 4, Arka Anamika, Avantika, VRO- 6, HOK-152	Utkal Gourav	33.33	Utilization of proper varieties.
		Shakti JK	50	
		Parbanikranti	16.66	
5.Seed Cost	Rs.1000/kg	Rs.1200/kg		+20%
6.Yield	130-150 q/ha.	100 q/ha.		-23% to -33%
7.Disease control measure	Yellow Mosaic virus- Vector control by using insecticide, Cercospora leaf spot- Bavistin@1.5g/l.	Using Chemicals (Tozin, Sonata)	83.33	Aware about disease control measure.
		Not Using Chemicals	16.66	
8.pest control measure	Aphid- - Rogor@2ml/l., Fruit borer- Padan@2g/l. of water	Using Pesticide (but couldn't tell the name)	50	Lack of awareness regarding pest control measure.
		Not Using Pesticide	50	
9.Cost of cultivation	Rs.70000/ha.	Rs.60000/ha.		-14%

*Average of 6 farmers

Cucumber

It was found that cucumber growing homestead farmers were using 67% more quantity of seeds as compared to the recommendation (Table 2). It was also found that about 26.08% farmers were using Gromor+FYM and 73.91% farmers were using only FYM as a source of manure. It is clear that farmers were not applied any potash-rich fertilizer and most of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. The fertilizer dose was found to be 12kg N, 12kg P_2O_5 and 5kg K_2O per hectare which is a very low fertilizer dose. About 8.7%, 4.34% and 86.96% farmers were using lucky, Japanese green and unknown varieties respectively as seeds for cultivation of cucumber. Farmers were using seeds which have exact same cost as recommended seed cost. The yield was -47% to -60% lesser as compared to the expected yield. Farmers were not using any fungicide and pesticides for disease and pest control. The cost of cultivation was 37.5% lesser than the expected cost of cultivation.

Table 2: Performance of cucumber in homestead agroforestry

Cucumber	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	3Kg/ha.	5kg/ha.		+67%
2.Source of fertilizer	Urea, DAP/SSP, MOP	Gromor+FYM	26.08	Imbalanced application of fertilizer.
		FYM	73.91	Non-application of inorganic fertilizers.
3.Fertilizer dose	50kg.- N/ha	12kg- N/ha		Imbalanced fertilizer dose.
	30Kg- P_2O_5/ha	12kg- P_2O_5/ha		
	50Kg- K_2O/ha	0kg- K_2O/ha		
4.Varieties/hybrids	Poinsette	Lucky	8.7	Lack of awareness & technology transfer.
		Japanese green	4.34	
		Unknown Variety	86.96	
5.Seed Cost	Rs.500/kg	Rs.500/kg		0%
6.Yield	150-200 Q/ha.	80Q/ha.		-47% to -60%
7.Disease control measure	Powdery mildew- Sulphur dusting@25kg/ha. Or Kavach @ 1ml/l. of water, Downy mildew- Indofil-M-45@3g/l	Using Chemicals	0	Lack of awareness regarding disease control measure.
		Not Using Chemicals	100	
8.pest control measure	Beetle- Triazophos@2ml/l. of water, Fruit fly- Padan@2g/l. of water	Using Pesticides	0	Lack of awareness regarding pest control measure.
		Not Using Pesticides	100	
9.Cost of cultivation	Rs.40000/ha.	Rs.25000/ha		-37.5%

*Average of 23 farmers

Ridge gourd

It was found that ridge gourd growing homestead farmers were using same quantity of seeds as compared to the recommendation (Table 3). It was also found that farmers were not using any fertilizer, but only using FYM. It is clear that most of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. About 42.85% and 57.15% farmers were using Rohini and unknown varieties respectively as seeds for cultivation of ridge gourd. Farmers were using seeds which were 10% costlier than recommended seed cost. The yield was 53% to 65% lesser as compared to the expected yield. Farmers were not using any fungicide and pesticides for disease and pest control. The cost of cultivation was 40% lesser than the expected cost of cultivation.

Table 3: Performance of ridge gourd in homestead agroforestry

Ridge gourd	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	4Kg/ha.	4Kg/ha		0%
2.Source of fertilizer	Urea, DAP/SSP, MOP	FYM	100	Non-application of inorganic fertilizers.
3.Fertilizer dose	50kg.- N/ha	Not using fertilizer		----------
	30Kg- P_2O_5/ha			
	50Kg- K_2O/ha			
4.Varieties/hybrids	Utkal Manjushree, Pusa Nasdar	Rohini	42.85	Lack of awareness & technology transfer.
		Unknown Variety	57.15	
5.Seed Cost	Rs.500/kg	Rs.550/kg		+10%
6.Yield	150-200 q/ha.	70q/ha.		-53% to -65%
7.Disease control measure	Powdery mildew- Sulphur dusting@25kg/ha. Or Kavach@ 1ml/l. of water, Downy mildew- Indofil-M-45@3g/l	Using Chemicals	0	Lack of awareness regarding disease control measure.
		Not Using Chemicals	100	
8.pest control measure	Fruit fly- Padan@2g/l. of water	Using Pesticides	0	Lack of awareness regarding pest control measure.
		Not Using Pesticides	100	
9.Cost of cultivation	Rs.50000/ha.	Rs.30000/ha		-40%

*Average of 7 farmers

Bitter gourd

It was found that bitter gourd growing homestead farmers were using 25% more quantity of seeds as compared to the recommendation (Table 4). It was also found that about 25% farmers were using Urea+FYM and 75% farmers were using only FYM as a source of manure. It is clear that farmers were not applying any phosphorous and potash-rich fertilizer and most of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. The fertilizer dose was found to be 18kg N, 0kg P_2O_5 and 0kg K_2O per hectare which is an imbalanced fertilizer dose. About 33.33% and 66.66% farmers were using Nakhara and unknown varieties respectively as seeds for cultivation of bitter gourd. Farmers were using seeds which have were 10% costlier than the recommended seed cost. The yield was -43.33% lesser as compared to the expected yield. Farmers were not using any fungicide and pesticides for disease and pest control. The cost of cultivation was 37.5% lesser than the expected cost of cultivation.

Table 4: Performance of bitter gourd in homestead agroforestry

Bitter gourd	Recommended practice	Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	4Kg/ha.	5kg/ha.		+25%
2.Source of fertilizer	Urea, DAP/SSP, MOP	Urea+FYM	25	Imbalanced application of fertilizer.
		FYM	75	Non-application of inorganic fertilizers.
3.Fertilizer dose	50Kg- N/ha	18Kg- N/ha		Imbalanced fertilizer dose.
	30Kg- P_2O_5/ha	0Kg- P_2O_5/ha		
	50Kg- K_2O/ha	0Kg- K_2O/ha		
4.Varieties/hybrids	Pusa Domousumi, Arka Harit, BBG- 5	Nakhara	33.33	Lack of awareness & technology transfer.
		Unknown Variety	66.66	
5.Seed Cost	Rs.500/kg	Rs.550/kg		+10%
6.Yield	150 Q/ha.	85Q/ha.		-43.33%
7.Disease control measure	Powdery mildew- Sulphur dusting@25kg/ha. Or Kavach@ 1ml/l. of water, Downy mildew- Indofil-M-45@3g/l	Using Chemicals	0	Lack of awareness regarding disease control measure.
		Not Using Chemicals	100	
8.pest control measure	Fruit fly- Padan@2g/l. of water	Using Pesticide	0	Lack of awareness regarding pest control measure.
		Not Using Pesticide	100	
9.Cost of cultivation	Rs.40000/ha.	Rs.25000/ha.		-37.5%

*Average of 12 farmers

Pumpkin

It was found that pumpkin growing homestead farmers were using 40% more quantity of seeds as compared to the recommendation (**Table 5**). It was also found that farmers were not using any fertilizer, but only using FYM. It is clear that most of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. About 33.33%, 11.11% and 55.55% farmers were using Guamala, Guamala & Baidyabati and unknown varieties respectively as seeds for cultivation of pumpkin. Farmers were using seeds which have same cost as expected seed cost. The yield was 24% lesser as compared to the expected yield. For disease control measure, 5.55% farmers were using chemicals and 94.45% were not using any fungicide. Farmers were not using any pesticides for pest control. The cost of cultivation was 40% lesser than the expected cost of cultivation.

Table 5: Performance of pumpkin in homestead agroforestry

Pumpkin	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	5Kg/ha.	7Kg/ha.		+40%
2.Source of fertilizer	Urea, DAP/SSP, MOP	FYM	100	Non-application of inorganic fertilizers.
3.Fertilizer dose	75kg.- N/ha	Not using fertilizer		Non-application of inorganic fertilizers.
	75Kg- P_2O_5/ha			
	75Kg- K_2O/ha			
4.Varieties/hybrids	Pusa Biswas, Arka Suryamukhi, Guamala, Baidyabati	Guamala	33.33	Lack of awareness & technology transfer.
		Guamala+Baidyabati	11.11	
		Unknown Variety	55.55	
5.Seed Cost	Rs.600/kg	Rs.600Kg/ha.		0%
6.Yield	250 q/ha.	190 q/ha.		-24%
7.Disease control measure	Powdery mildew- Sulphur dusting@25kg/ha. Or Kavach@ 1ml/l. of water, Downy mildew- Indofil-M-45@3g/l	Using Chemicals	5.55	Lack of awareness regarding disease control measure.
		Not Using Chemicals	94.45	
8.pest control measure	Fruit fly- Padan@2g/l. of water	Using Pesticide	0	Lack of awareness regarding pest control measure.
		Not Using Pesticide	100	
9.Cost of cultivation	Rs.50000/ha.	Rs.30000/ha.		-40%

*Average of 18 farmers

Ginger

It was found that ginger growing homestead farmers were using 27% more quantity of seeds as compared to the recommendation (Table 6). It was also found that about 40% farmers were using FYM+Urea+DAP, 40% farmers were using FYM+Gromor+Urea and 20% farmers were using only FYM as a source of manure. It is clear that farmers were not applying any potash-rich fertilizer and some of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. The fertilizer dose was found to be 32kg N, 30kg P_2O_5 and 0kg K_2O per hectare which is an imbalanced fertilizer dose. The farmers didn't know the name of seed variety which they were grown. Farmers were using seeds which were same as cost as the recommended seed cost. The yield was 33% lesser as compared to the expected yield. For disease control measure, 80% farmers were using chemicals, but they didn't know the name of fungicide and 20% were not using any fungicide. For pest control measure, none of the farmers were used any pesticides. The cost of cultivation was 12.5% lesser than the expected cost of cultivation.

Table 6: Performance of ginger in homestead agroforestry

Ginger	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	15q/ha.	19q/ha.		+27%
2.Source of fertilizer	Urea, DAP/SSP, MOP	Urea+Gromor+FYM	40	Imbalanced application of fertilizer.
		Urea+DAP+FYM	40	Imbalanced application of fertilizer.
		FYM	20	Non-application of inorganic fertilizers.
3.Fertilizer dose	50kg.- N/ha	32Kg- N		Imbalanced fertilizer dose.
	50Kg- P_2O_5/ha	30Kg- P_2O_5/ha		
	75Kg- K_2O/ha	0Kg- K_2O/ha		
4.Varieties/hybrids	Suruchi, Suprava, Amba	Unknown Variety	100	Lack of awareness & technology transfer.
5.Seed Cost	Rs.500/kg	Rs.500/kg		0%
6.Yield	150 q/ha.	100q/ha.		-33%
7.Disease control measure	Leaf spot- Blitox@12.5kg, Shoot rot- Indofil-M-45@3g/l	Using Chemicals (but couldn't tell the name)	80	Do not know about the fungicides spraying.
		Not Using Chemicals	20	
8.pest control measure	Shoot borer- Chloropyropos@1l.	Using Pesticide	0	Lack of awareness regarding pest control measure.
		Not Using Pesticide	100	
9.Cost of cultivation	Rs.40000/ha.	Rs.35000/ha.		-12.5%

*Average of 5 farmers

Turmeric

It was found that turmeric growing homestead farmers were using 25% more quantity of seeds as compared to the recommendation (Table 7). It was also found that about 20% farmers were using Shamala+FYM and 80% farmers were using only FYM as a source of manure. It is clear that most of the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. The fertilizer dose was found to be 6kg N, 6kg P_2O_5 and 6kg K_2O per hectare which is very less as compared to the recommended fertilizer dose. About 20% and 80% farmers were using Rashmi and unknown varieties respectively as seeds for cultivation of turmeric. Farmers were using seeds which were same as cost as the recommended seed cost. The yield was 33% lesser as compared to the expected yield. For disease control measure, 20% farmers were using chemicals, but they didn't know the name of fungicide and 80% were not using any fungicide. For pest control measure, 20% farmers were using pesticides, but they didn't know the name of pesticides and 80% were not using any pesticides. The cost of cultivation was 20% lesser than the expected cost of cultivation.

Table 7: Performance of turmeric in homestead agroforestry

Turmeric	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	20q/ha.	25q/ha.		+25%
2.Source of fertilizer	Urea, DAP/SSP, MOP	Shamala+FYM	20	Imbalanced application of fertilizer.
		FYM	80	Non-application of inorganic fertilizers.
3.Fertilizer dose	60kg.- N/ha	6kg- N/ha		Imbalanced fertilizer dose.
	30Kg- P_2O_5/ha	6Kg- P_2O_5/ha		
	90Kg- K_2O/ha	6Kg- K_2O/ha		
4.Varieties/hybrids	Surama, Roma, Ranga	Rashmi	20	Lack of awareness & technology transfer.
		Unknown Variety	80	
5.Seed Cost	Rs.500/kg	Rs.500/Kg		0%
6.Yield	200 q/ha.- Raw	130q/ha.- Raw		-35%
	75 q/ha.- Dry	50q/ha.- Dry		-33%
7.Disease control measure	Shoot rot- Indofil-M-45@3g/l	Using Chemicals (but couldn't tell the name)	20	Lack of awareness regarding disease control measure.
		Not Using Chemicals	80	
8.pest control measure	Shoot borer- Chloropyriphos@1l.	Using Pesticide (but couldn't tell the name)	20	Lack of awareness regarding pest control measure.
		Not Using Pesticide	80	
9.Cost of cultivation	Rs.40000/ha.	Rs.32000/ha.		-20%

*Average of 5 farmers

Amaranthus

It was found that amaranthus growing homestead farmers were using 25% more quantity of seeds as compared to the recommendation (Table 8). It was also found that farmers were not using any fertilizer, but only using FYM. It is clear that all the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. Farmers were using local variety for cultivation of amaranthus. Farmers were using seeds which were 35% less costly than recommended seed cost. The yield was 30% to 47.5% lesser as compared to the expected yield. Farmers were not using any fungicide and pesticides for disease and pest control. The cost of cultivation was 57% lesser than the expected cost of cultivation.

Table 8: Performance of amaranthus in homestead agroforestry

Amaranthus	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	2Kg/ha	2.5Kg/ha.		+25%
2.Source of fertilizer	Urea, DAP/SSP, MOP	FYM	100	Non-application of inorganic fertilizers.
3.Fertilizer dose	50kg-N/ha	Not using fertilizers		Non-application of inorganic fertilizers.
	30kg- P_2O_5/ha			
	30kg- K_2O/ha			
4.Varieties/hybrids	Utkal Mayuri	Local Variety	100	Lack of awareness & technology transfer.
5.Seed Cost	Rs.200/Kg	Rs.130/Kg		-35%
6.Yield	150-200 q/ha.	105 q/ha.		-30% to -47.5%
7.Disease control measure	Leaf spot- Bavistin@1.5g/l., Damping off- Soil drenching with Captan@2g/l. of water	Using Chemicals	0	Lack of awareness regarding disease control measure.
		Not Using Chemicals	100	
8.pest control measure	Beetle- Triazophos@2ml/l. of water	Using Pesticide	0	Lack of awareness regarding pest control measure.
		Not Using Pesticide	100	
9.Cost of cultivation	Rs.30000/ha	Rs.13000/ha.		-57%

*Average of 14 farmers

Basella

It was found that basella growing homestead farmers were using 15% less quantity of seeds as compared to the recommendation (Table 9). It was also found that farmers were not using any fertilizer, but only using FYM. It is clear that all the farmers were either practising organic farming or unwilling to apply inorganic fertilizers. Farmers were using local variety for cultivation for cultivation of basella. Farmers were using seeds which were 10% costlier than recommended seed cost. The yield was 35% to 44% lesser as compared to the expected yield. Farmers were not using any fungicide and pesticides for disease and pest control. The cost of cultivation was 60% lesser than the expected cost of cultivation.

Table 9: Performance of basella in homestead agroforestry

Basella	Recommended practice	*Farmer's practice		Remarks/Gap
			R%	
1. Seed rate	5Kg/ha	4.25Kg/ha.		-15%
2.Source of fertilizer	Urea, DAP/SSP, MOP	FYM	100	Non-application of inorganic fertilizers.
3.Fertilizer dose	50kg-N/ha	Not Using Fertilizer		Non-application of inorganic fertilizers.
	30kg- P_2O_5/ha			
	30kg- K_2O/ha			
4.Varieties/hybrids	Local variety green and red	Local Variety	100	Lack of awareness & technology transfer.
5.Seed Cost				
6.Yield	300-350 q/ha.	195 q/ha.		-35% to -44%
7.Disease control measure	Leaf spot- Bavistin@1.5g/l.	Using Chemicals	0	Lack of awareness regarding disease control measure.
		Not Using Chemicals	100	
8.pest control measure	---	---		---
9.Cost of cultivation	Rs.30000/ha	Rs.12000/ha.		-60%

*Average of 17 farmers

In the present study area it was observed that yield of vegetables like okra, turmeric, ginger, pumpkin, cucumber, ridge gourd, bitter gourd, amaranthus and basella were very low than the expected yield in the homestead agroforestry systems. Hossain (1996) observed the homestead vegetable production. He also found that vegetable production was very low in home gardens of Bangladesh. Government and non-government organizations have been working since the 1980s to improve and increase vegetable production in home gardens and on marginal farms in Bangladesh. Efforts have to date not been coordinated. Coordination of research and development effort is recommended.

Conclusion

It was concluded that there is lack of awareness and scientific practices specific to that agroclimatic condition & availability of natural resources for maximum income from the homestead agroforestry system. The local farmers may go through recommended crop production practices**.**

References

1. Brown S. Estimating biomass and biomass change of tropical forests: a primer. (FAO Forestry paper- 134), FAO, Rome, 1997, 19-22.
2. Callicott JB. Multicultural environmental ethics. Daedalus. 2001; 130(4):77-98.
3. Chaturvedi OP, Das DK. Effect of bund trees on soil fertility and yield of crops. Range Management and Agroforestry. 2002; 23:90-94.
4. Chowdhury MK, Sattar MA. Agroforestry practices in traditional farming system of Bangladesh. A report prepared by BARC- Winrock Inter Dhaka- Bangladesh, 1993, 23-55.
5. Haque MA. Dry land agroforestry. In Haque MA (Ed). Agroforestry in Bangladesh Village and Farm forestry in Bangladesh Join pub. Swiss dev. Coop., Dhaka and Bangladesh Agric. Univ., Mymensingh, 1996, 71-94.
6. Infield M. Cultural values: a forgotten strategy for building community support for protected areas in Africa. Conservation Biology. 2001; 15:800-801.