IMPACT OF HOMESTEAD FARMING ON THE LIVELIHOOD AND FARM ECONOMY IN SOME SELECTED AREAS OF NARSINDI AND GAZIPUR DISTRICTS

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ABSTRACT

The study was conducted at Shibpur Upazila in Narsingdi district and Gazipur Sadar Upazila in Gazipur district during the period of January to June 2007. The study was designed to asses the impact and present status of the technologies implemented during December 1997 to June 2004 under Agricultural Diversification and Intensification Project (ADIP). A sample of 100 beneficiaries was interviewed using a pre-tested interview schedule to collect the necessary information keeping the objectives of the study in mind. The beneficiaries were selected through random sampling method from 4 unions. Majority of the respondents (70%) were in the middle aged (36-50 years) group, while 60% of the respondents were in the primary level education, having average farm size of 0.221 ha. Seventy percent of the respondents got different types of training, of which 43% participated homestead vegetable cultivation training. Among the implemented technologies through ADIP, most of the beneficiaries were benefited and adopted it for a continued use. The technologies backed up by ADIP were found desirable as perceived from the opinions of the concerned farmers. Most of the technologies like introduction of new varieties, seedling raising, sustained significantly. The impact of ADIP was judged through the life style of the respondents. Most of those criteria were correlated with the individual characteristics of the respondents. Education, farm size, cosmopoliteness, training received had significant relationship with the impact like change in income, food consumption, health and sanitation. The average annual income of respondents increased from Tk 42,000.00 to Tk 71,000.00 while food consumption enhanced from 1700 Kcal to 2050 Kcal.

Key words: Homestead farming, livelihood, farm economy

INTRODUCTION

Homestead is the most complex multi-strata integrated production system that combines all farming components viz. tree, crops, livestock, and occasionally fish, and provides household food security, employment and income generation opportunity to the million of households (Ahmad and Shahjahan, 1993). It evolved through generation of gradual intensification of cropping in response to increasing human resource and corresponding the shortage of arable lands. It is the fixed asset for rural poor farmers and obviously plays many important roles in their household economy. Almost every family including the so-called landless category has a home garden. Bangladesh has about 15 million households, of which 13 million are rural (Anon, 2000). Approximately 7% area (0.58 million ha) of total 8.4 million ha of cultivable land are occupied by homesteads. The size of homestead ranged from 0.027 ha in floodplain area to 0.03 ha in charland (Anon, 2005). Actual area of homestead devoted to vegetables and fruit gardening is very small. Landless and marginal farmers have no or very small crop field. Usually they are maintaining their livelihood by utilizing the homestead and selling of labor. Home garden, the most stable resource, plays an important role in Bangladesh economy and provides nearly 50% cash flow to the rural poor (Abedin and Quddus, 1990). Collectively, homestead production system contributes about 70% fruit, 40% vegetables, 70% timber and 90% firewood and bamboo requirement of the country (Miah and Hussain, 2004).

Agricultural Diversification and Intensification Project (ADIP) was one of the most important projects, which were mostly involved homestead farming activities. It was implemented by four organizations.

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Among them, Department of Agricultural Extension (DAE) had provided agricultural technology to the farmer and Non- Government Organizations (NGOs) had provided micro credit to the farmer through which they had arranged agricultural inputs. Local Government Engineering Department (LGED) developed infrastructure like roads, growth center, market etc. and Bank provided loan to the NGOs for micro credit.

In order to meet up the goal of managing livelihood status and improving socio-economic condition of the rural people, ADIP had implemented a six years durated (1997 to 2004) project in the District of Narsingdi, Kishorgonj, Gazipur and Tangail. The project activities ended on last June, 2004. All support services related to the project were withdrawn with the completion of the project. The status of the technology provided by ADIP at field level has not been evaluated by any systematic study. Moreover, the socio-economic changes due to the introduction of the technologies were not yet been determined by any agencies. There is a necessity to examine the present status of the project lying people regarding the technology implemented by them and also their socio-economic changes after completion of the project. Considering the situations the study was undertaken to determine the existing status of homestead farming activities implemented under ADIP and to asses its socio-economic benefits and to identify problems created by the project activities.

MATIRIALS AND METHODS

The study sites were selected as representative for the research activities, where 8 unions in Shibpur Upazila and 5 unions in Gazipur Sadar Upazila were involved in ADIP activities. Two unions from each upazila and then one village from each union were selected as study site. The two unions and two villages from Shibpur upazila were Putia and Baghabo, and Purandia and Kamartec, respectively. On the other hand, the two unions and two villages from Gazipur Sadar upazila were Mirjapur and Taltail, and Kayaltia, respectively. The study was designed to asses the impact and present status of the technologies implemented during December 1997 to June 2004 under Agricultural Diversification and Intensification Project (ADIP). Hundred respondents were selected through random sampling technique from two Narsingdi and Gazipur districts. Data were personally collected from June 2007 to July 2007 by the researcher himself through structured and unstructured questionnaire and these were compiled, analyzed and interpreted as per objectives of the study. The individual characteristics including age, family size, education, cosmopoliteness, change in income, change in food consumption, change in asset, change in health and sanitation, change in source of drinking water, change in toilet condition and change of family expenditure were variable of this study.

Data obtained from the respondents were compiled, tabulated and analyzed in accordance with the objectives of the study. Statistical Package of Social Science (SPSS) computer software was used to analyze the data. Statistical measures such as frequency counts, percentages, range, mean and standard deviation were used to describe the data. In order to examine the relationship among the variables, coefficient of correlation was used.

RESULTS AND DISCUSSION

Behavior of an individual is determined to a large extent by the personal characteristics of the respondents; the demographic characteristics were identified for investigation in this study. These characteristics are discussed under the following sub-heads. Data found from Table 1 indicated that majority of the respondents belong to middle age groups that was 56% compared to 27 and 17% low and old age group, respectively. Sixty percent respondents had primary level education and 35% had secondary level education. The highest 56% of the respondents were marginal farmer, no medium and large farm size. Seventy percent of the respondents received training from DAE at different duration, whereas, rest of them (30%) did not receive any training. About 50% of the respondents received one time training and 11, 9 and 3% of the respondents received two, three and four times trainings,

respectively, during the implementation of ADIP. Most of the trainings were directly related to the homestead activities.

Table 1. Salient features of the respondents with their characteristics

Characteristics	Measuring unit	Range		Categories	Respondents (N=100)		Mean	SD
		Possible	Observed		Number	Percent		
Age	Actual Years	Unknown	23 - >50	Young (23-35)	27	27	40.54	8.60
				Middle aged (36-50)	56	56		
				Old age group(> 50)	17	17		
Level of Education	Year of schooling	Unknown	0	Illiterate	3	3	-	-
			1-5	Primary level education (I-V Class)	60	60		
			6-10	Secondary level education (VI-X Class)	35	35		
			>10	Higher secondary or above	2	2		
Farm size	Number	Unknown	<0.02 - >3.03	Land less (<0.02)	5	5	0.221	0.124
				Marginal (0.02-0.19)	56	56		
				Small (0.2-1.0)	39	39		
				Medium (1.01- 3.03)	0	0		
				Large (>3.03)	0	0		
Training received	Number	Unknown		No training	30	30	-	-
				One training	47	47		
				Two training	11	11		
				Three training	9	9		
				Four training	3	3		
Item wise training received	Number	Unknown		Vegetable cultivation in homestead	43	39.81	-	-
				Fruit tree plantation and management	36	33.33		
				Vegetable seed production and preservation	25	23.15		
				Budding and grafting	4	3.71		
Cosmopoliteness	Score	Unknown		Low(8-12)	64	64	12.85	5.46
				Medium(13-20)	29	29		
				High(>20)	7	7		
				good	43	53.8		
				very good	29	36.2		

Study showed that 39.81 and 33.33% of the respondents received training on homestead vegetables cultivation, and fruit tree plantation and management. The maximum (64%) of the respondents had low cosmopoliteness, while 29 and 7% of the respondents had medium and high cosmopoliteness, respectively. The maximum (64%) of the respondents had low cosmopoliteness, while 29 and 7% of the respondents had medium and high cosmopoliteness, respectively.

Homestead farming activities

In homestead farming programme, vegetables is one of the most important component of the homestead area. ADIP had offered some technological intervention for their beneficiaries. The survey findings of these technologies are given below.

Kalikapur model

Kalikapur model of vegetable production in homestead area is a year-round vegetable production in a land area of 6 m x 6 m. Research activities were initiated by BARI during the early eighties to find out ways to boost vegetable production in the homesteads. Table 2 showed that 49% of the respondents adopted Kalikapur model for vegetable cultivation during project period. But after completion of the project, the continuity of the model had been declining over time. The present study showed that only 15% of the respondents continued to cultivate vegetables through this model.

Table 2. Distribution of the respondents according to involvement in vegetables cultivation through Kalikapur model

Status	Respondent			
	During implementation of ADIP		After complementation of ADIP	
	Number of respondent	Percent	Number of respondent	Percent
Used Kalikapur model	49	49	15	15
Didn't use Kalikapur model	51	51	85	85
Total	100	100	100	100

New varieties of vegetables

The results depicted in Table 3 shows the cent percent of the respondents adopted the new varieties of tomato, lady's finger, bitter gourd, radish, red amaranth, cabbage, cauliflower and brinjal during project period. But the completion of the project, over 90% of the respondents were continuing the cultivation of new varieties of lady's finger, red amaranth and brinjal; 80 to 90% of the respondents were cultivating the new varieties of radish, cauliflower and cabbage; and about 75% were cultivating the new varieties of tomato and bitter gourd. The findings revealed that though the number of farmers involved in different vegetables cultivation declined over time, the trend was still hopeful.

Table 3. Status of the cultivation of new vegetable varieties

Vegetables name	Cultivated new variety during implementation of ADIP		Cultivated new variety After completion of ADIP	
	Number of cultivating farmer	Percent	Number of cultivating farmer	Percent
Tomato	79	100	60	76
Lady's finger	81	100	80	98
Bitter gourd	20	100	15	75
Radish	58	100	50	86
Red amaranth	88	100	82	93
Cabbage	11	100	9	82
Cauliflower	26	100	22	84
Brinjal	81	100	76	94

Vegetable seedling raising activities

Seedling is the most important factor for vegetable production in the homestead area. Table 4 shows that 66% of the respondents raised vegetable seedlings by themselves during running of the project. After completion of the project, 62% of the respondents were producing vegetable seedlings in their homestead area.

Table 4. Distribution of the number of respondents according to the vegetable seedlings raising activities

Technology	Respondents			
	During implementation of ADIP		After completion of ADIP	
	No. of respondent	Percent	No. of respondent	Percent
Produced seedling	66	66	62	62
Brought from others	34	34	38	38
Total	100	100	100	100

Vegetable seed storage

Vegetable seed storage is important for keeping viability of seeds for next season use. Farmers were well trained regarding this aspect during the project period. The respondents kept their seeds following three processes namely polybag, plastic pot and glass bottles. Polybag system is the modern techniques for seed storage but polybag is not available for rural people due to the government restriction. Table 5 showed that the polybag system was reduced from 47 to 15%. Plastic pot and glass bottles were available in the market, so the plastic pot and glass bottle system were increased from 81 to 98% and 23 to 38 %, respectively.

Table 5. Distribution of respondents according to vegetable seed storage

Method of seed storage	Seed storage by the respondents			
	During implementation of ADIP		After completion of ADIP	
	Number of respondents	Percent	Number of respondents	Percent
Polybag	47	47	15	15
Pot	81	81	98	98
Glass bottle	23	23	38	38

Vegetable consumption

Vegetables consumption usually is increasing day by day among the people of the country. The results depicted in Table 6 showes that a tremendous change occurred regarding nutritional status among the beneficiaries of ADIP. The range of consumption was divided in to four categories (0-50 g, 51-100 g, 101-150 g and 151-200 g) depending on the amount of vegetables consumed per head per day. The maximum respondents were found to intake 51-100 g (before 45% and after 47% project). Table 6 also shows that significant number of respondents (35%) consumed very few amount of (0-50g) of vegetables before the project time. However, after completion of the project, remarkable number of respondents consumed more vegetables. Table also indicated that respondents changed and became more conscious about their food habit after the project.

Table 6. Distribution of respondents according to consumption of vegetables

Range of consumption (g)	Consumption of vegetables (g/person/day)			
	Before joining the project		After completion of the project	
	Number of respondent	Percent	Number of respondent	Percent
0-50	35	35	5	5
51-100	45	45	57	57
101-150	15	15	30	30
151-200	5	5	8	8

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Fruit tree production

Fruit tree is one of the most important components of the homestead. ADIP offered some technological interventions for the respondents. Farmers adopted the cultivation of new varieties as the new varieties provided greater benefits in terms of yield, quality and availability than conventional varieties. Table 7 shows that all the respondents had planted new variety of fruit species during implementation of the project. It was possible due to supply of seedlings and saplings from the project. Study showed that the average number of increased plantation was for jackfruit (4), followed by coconut (2.8), mango (2.48), lemon (2.26), guava (2.16), jujube (1.72) and litchi (1.60). On the other hand, 76, 55, 90, 72, 60 and 76% of the respondents were planted new varieties for mango, jujube, lemon, guava, litchi and coconut, respectively after completion of the project. Table 18 also showed that the average number of planted new varieties increased only for lemon but all the other items decreased after completion of the project.

Table 7. Distribution of respondents according to adoption of new varieties of fruit saplings

Name of the fruit tree	Planted new varieties during implementation of ADIP			Planted new varieties after completion of ADIP		
	Number of farmer	Percent	Average number of planted sapling per respondents	Number of cultivating farmer	Percent	Average number of planted sapling per respondents
Mango	89	100	2.48	65	76	1.50
Jujube	18	100	1.72	10	55	1
Lemon	89	100	2.26	80	90	2.50
Guava	97	100	2.16	70	72	2
Litchi	5	100	1.6	3	60	1
Coconut	85	100	2.8	65	76	2.26

Socio-economic development of the respondents

For measuring the impact of ADIP, the present living condition of the beneficiaries was compared with the past condition (before working with ADIP). The change in living condition of the beneficiaries can be assessed by considering the change in income, change in food consumption, change in family asset, change in health and sanitation and change in family expenditure of the beneficiaries of ADIP.

Change in income

Before working with ADIP, the average annual income of the respondents was Tk 42000 and after completion of ADIP the average annual income of the respondents raised to Tk 71000, on an average, change in income of the each beneficiary was Tk 27000 (Table 8).

Table 8. Change in annual income of the beneficiaries

Annual income	Annual income (Tk./respondent)		
	Maximum	Minimum	Average
Before participation in ADIP	60000	35000	42000
After participation in ADIP	110000	60000	71000
Change	52000	11000	27000

Change in food consumption

Before working with ADIP, the average food consumption of the respondents was 1700 Kcal per day; and after completion of ADIP, the average food consumption of the respondents became 2050 Kcal per day. On an average, the change in food consumption of the beneficiaries was 470 Kcal per day (Table 9).

Table 9. Change in food consumption of the beneficiaries

Food consumption	Food consumption (Kcal per respondent)		
	Maximum	Minimum	Average
Before participation in ADIP	2100	1400	1700
After participation in ADIP	2400	1950	2050
Change	800	250	470

Change in health and sanitation

Data presented in Table 10 indicated that social development of the respondents was in the positive direction due to involvement with the project. Before involvement with the Project, 29, 65, and 6% of the respondents used 'kua', neighbor's 'tube well' and 'own tube well' for their source of drinking water, respectively. After receiving training and support from the project, cent percent of the respondents installed tube well. Similarly, before involvement in the project, 81 and 19% respondents were using 'kacha' and 'pucca' latrine, respectively. After receiving training and support from ADIP, cent percent respondents were using pucca latrine. To ensure 100% safe drinking water and good sanitation system, many GO and NGOs were promoting different projects to contribute.

Table 10. Distribution of the respondents according to the source of drinking water and sanitary latrine

Item		Respondents			
		Before participation in ADIP		After participation in ADIP	
		Number	Percent	Number	Percent
Source of drinking water	Kua/Pond	29	29	0	0
	Other's Tube well	65	65	4	4
	Own Tube well	6	6	96	96
Latrine used	Kacha	81	81	0	0
	Sanitary Latrine	19	19	100	100

Change in family expenditure

Data furnished in the Table 11 indicated that after getting the benefits from ADIP, many respondents expressed "satisfied" in case of food, cloth, education, medical treatment, entertainment and festival celebration increased from 9 to 51, 8 to 76, 10 to 79 and 8 to 77, 17 to 63, and 17 to 61%, respectively. In contrast, number of respondents of "not satisfied" decreased from 26 to 0, 32 to 0, 19 to 1, 30 to 1, 15 to 1 and 6 to 1%, respectively. From this analysis, it can be concluded that level of satisfaction of the respondents about family expenditure increased remarkably.

Table 11. Distribution of the respondents according to the change of family expenditure

Level of satisfaction (number)	Level of satisfaction in family expenditure (respondents)											
	Food		Cloth		Education		Medical		Entertainment		Social festival	
	Before ADIP	After ADIP	Before ADIP	After ADIP	Before ADIP	After ADIP	Before ADIP	After ADIP	Before ADIP	After ADIP	Before ADIP	After ADIP
Very satisfied	0	45	0	18	0	14	0	16	0	30	0	34
Satisfied	9	51	8	76	10	79	8	77	17	63	17	61
Less satisfied	65	4	60	6	71	6	62	7	68	6	77	4
Not satisfied	26	0	32	0	19	1	30	1	15	1	6	1

Relationship between the respondents' characteristics and changes in life style through ADIP

Change in income, food consumption, family asset and health and sanitation were the main dimensions of impact of ADIP. This section deals with the relationships of the 6 selected characteristics viz. age, education, family size, farm size, cosmopoliteness and training of the respondents with each of their life style (change in income, food consumption, family asset, health and sanitation). Pearson's Product Movement Co-efficient of Correlation (r) was used to explore the relationship between 6 characteristics of the respondents with their life style. Five percent level of significance was used as the basis for acceptance or rejection of a hypothesis. The computed values of correlation co-efficient (r) were compared with the relevant tabulated values in order to determine if the relationships between the selected characteristics of the respondents and the life style changes through ADIP were significant. The summery of the results of correlation analyses have been presented in Table 12.

Table 12. Co-efficient of correlation (r) showing relationship between the respondents selected characteristics and the impact of ADIP

Independent variables	Change in income	Change in food consumption	Change in asset	Change in health and sanitation
Age	-0.408 NS	-0.412 NS	-0.248 NS	0.276 NS
Education	0.892**	0.847**	0.783**	0.638**
Family size	-0.126 NS	-0.050 NS	-0.085 NS	0.360 NS
Farm size	0.524**	0.633**	0.614**	0.347**
Cosmopoliteness	0.828**	0.753**	0.904**	0.477**
Training	0.914**	0.832**	0.822**	0.570**

NS = Not significant; * Significant at 5% level; ** Significant at 1% level.

From the findings of the study it was concluded that the status of the technologies implemented through ADIP was satisfactory. Among different technologies, cultivation of new varieties and technique had sustained properly at farmers fields. Findings revealed that the individual characteristics of the respondents like education, farm size, training received, cosmopoliteness had significant relationship with the change in income, food consumption and health, sanitation of the respondents.

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