
SMALL SCALE INTEGRATED AGRICULTURE: A TOOL OF POVERTY ALLEVIATION, GENDER EQUALITY PROMOTION AND IMPROVING FOOD SECURITY AT HOUSEHOLD LEVEL IN COASTAL REGION OF BANGLADESH**M.R. Begum^{1*}, M.N. Islam², M.S.I. Khan³, S. Islam² and M.A.I. Tapu²***Received 30 October 2015, Revised 13 December 2015, Accepted 22 December 2015, Published online 31 December 2015***Abstract**

In developing countries, small scale integrated agriculture acts as a tool for supplying the fast-growing human population with high-quality protein, additional income to poor and food security to household, especially women. This study was conducted in different SLOPB-Bangladesh project areas of Patuakhali, a coastal district of Bangladesh to observe the effect of small scale integrated agriculture on poverty alleviation, equality of gender promotion and food security at household level. After baseline survey with a structured questionnaire, a total of 583 women beneficiaries were selected from poor communities and given training and technical support on family poultry, aquaculture and homestead gardening from 2008 to 2012. Data of income were collected in every month and analyzed by one way ANOVA or F-test, used to test significant difference among the mean income of different years and one sample t-test, used to test the significance difference in percent (%) of yearly increase income in different years and from baseline. It was postulated that, the number of income getting women grew in an upward trend along the advances of time, and average yearly income became significantly from baseline and rose to 246, and 566.42% for family poultry and homestead gardening respectively. For all three activities, it was significantly climbed to 281.79%, which brings better food and nutritional security in household, and the women were self-employed, empowered, and more esteemed to their family members as well as society than ever before.

Keywords: Small Scale Integrated Agriculture, Income, Women Empowerment, Food Security

¹Department of Agricultural Economics and Social Sciences, Chittagong Veterinary and Animal Sciences University, Bangladesh; ²Empowerment of the Poor through Integrated Agriculture, SLOPB-Bangladesh; ³Department of Food Microbiology, Patuakhali Science and Technology University, Bangladesh.

*Corresponding author's email: rasustat@yahoo.com (M.R. Begum)

Introduction

History illustrates that different rates of poverty reduction over the past 40 years have been closely related to differences in agricultural performance – particularly the rate of growth of agricultural productivity (DFID, 2004). Poverty, measured by poverty line, a threshold level of income or expenditure, needed to meet food and non-food basic needs for a person to maintain a healthy and productive life (Hossain, 2004). Level of poverty in 2000 to be in the order of 50 per cent in contrast to 40 per cent derived on the basis of 1983 with roughly about 1 % reduction per year (World Bank, 2002). Since three-fourths of the population, with over 40% are poor, still lives in rural areas in Bangladesh, and this poverty rate descending very slowly by one percent per year due to high inequality in the distribution of income for both rural and urban areas (Sen, 2001). For this purpose, it remains a predominantly rural problem, where agriculture is central to livelihoods and, a study said that, 67% in South Asia are at least partly engaged in

agriculture (Maxwell, 2001). Therefore, any improvement in agriculture includes crop fisheries and livestock may raise rural incomes, which may exert a major impact on poverty (Warr, 2001). Moreso, agricultural development may be a prime mover of improving food security (DFID, 2004). Food security includes food availability and access, ensuring adequate diet of all members of household, achieved either by production or by purchase.

Recent household surveys shows that the consumption of cereals has reached a level much higher than the minimum nutritional requirement, there is a marginal deficit for tubers and vegetables and fish, but substantial deficits for pulses, oilseeds and livestock products. Thus, crop and agricultural diversification must be given priority in agricultural development strategy to achieve balanced nutrition (Hossain, 2004). For reaching, the Millennium Development Goal (MDG) of halving the proportion absolute poverty by 2015 would

depend on growing agricultural productivity, which is to be considered as single most important determinant of economic growth and poverty reduction (DFID, 2004). Therefore, intervention on all three activities is required to increase income, maintain better food security, and self-employment and empowerment of women. As it was proven that, small scale integrated agriculture is accessible to the poorest of the poor. Considering the above facts, the study was undertaken to observe the effect of small scale integrated agriculture on household level regarding increased income, increased food production and security, and promotion of gender equality.

Materials and Methods

Selection of target women

A total of 583 women, single from each household, based on convenient sampling method, were selected from different areas where they have the less land and their family led their lives mainly depending of different daily nominal and low-income activities like minimum agricultural activities in coastal Patuakhali district of Bangladesh.

Baseline survey

A pre structured and pre tested questionnaire was used to conduct the baseline survey in terms of demographic, socio-economic status, and monthly income from each three target components of small scale agriculture viz. family poultry, aquaculture and homestead gardening.

Training and information dissemination

To increase their income, different activities like participatory needs assessment and planning, weekly group meetings, training on all three activities, create linkage with markets and

continuous monitoring were done during the study period.

Data collection

Income of household from three main components of agriculture as family poultry, aquaculture and homestead gardening, after family consumption, considered as effects or result. The amount of income in BD taka was converted into Euro at the rate of 100 taka for 1 Euro. Data on income from three elements collected in every month from every beneficiary.

Data analysis

The measure of central location, average was used to calculate mean income in different years. One way analysis of variance (ANOVA) or F-test was used to compare means in different years income and t-test for increasing income from year to year and from baseline.

Results

Table 1 illustrates the household income from family poultry from baseline until 2011-2012. It was well mentioned that, after making up the family demand, the number of extra earning women increased from baseline 43.0 to 63.7, 60.0, 69.9 and 62.6% in the end successive years and, yearly income per household were highly significantly went up ($F = 20.81$; P -value < 0.01) from baseline BD Tk. 614 (or 0.02 Euro/day) to 1543 (or 0.04 Euro/day), 2148 (or 0.06 Euro/day), 2444 (0.07 Euro/day) and 2738 (0.075 Euro/day), whereas yearly increased income from baseline were significantly rose ($t = 7.70$; P -value < 0.05) to 151.33, 249.84, 298.04 and 246 % and, increasing from every preceding years were 151.3, 39.21, 13.78 and 12.03%.

Table 1. Descriptive statistics of household income from family poultry

	Base	2008-09	2009-10	2010-11	2011-12	P-value
Mean	614	1543	2148	2444	2738	***
N(%)	250 (42.9)	352(63.7)	344 (60)	384(69.9)	358(62.6)	
Euro/year	6.14	15.43	21.84	24.44	27.38	
Euro/day	0.017	0.042	0.06	0.067	0.075	
% yearly increase		151.3	39.21	13.78	12.03	NS
% increase from baseline		151.3	249.84	298.04	246	**

Significant at 5% level; *Significant at 1% level; NS=Not significant; N=No. of women; 1 Euro = 100 Tk

Table 2. Descriptive statistics of household income from aquaculture

	Base	2008-09	2009-10	2010-11	2011-12	P-value
Mean	1529	1575	2151	2714	3713	***
N(%)	354 (60.8)	318 (57)	304 (55.1)	290 (50.3)	310(54.1)	
Euro/year	15.29	15.75	21.51	27.14	37.13	
Euro/day	0.042	0.043	0.059	0.074	0.102	
% yearly increase		3	36.57	26.17	36.81	**
% increase from baseline		3	40.68	77.5	142.84	NS

Significant at 5% level; *Significant at 1% level; NS=Not significant; N=No. of women; 1 Euro = 100 Tk

Table 2 presents the data on household income from aquaculture where baseline was 60.8% which at the end of 2008-09, 2009-10, 2010-11 and 2011-12 were mounted to 57.0, 55.1, 50.3 and 54.1% respectively. The average yearly income became highly significantly increased ($F=20.42$; $P\text{-value}< 0.01$) from baseline BD Tk. 1529 (or 0.04 Euro/day) to 1575 (or 0.043

Euro/day), 2151 (or 0.059 Euro/day), 2714 (0.074 Euro/day) and 3713 (0.102 Euro/day) at the end of four years whereas yearly increased from baseline were reached to 3.00, 40.68, 77.5 and 142.84 % and, increasing from preceding years were significantly climbed ($t= 3.23$; $P\text{-value}<0.05$) to 3.00, 36.57, 26.17 and 36.81 %.

Table 3. Descriptive statistics of household income from homestead gardening

	Base	2008-09	2009-10	2010-11	2011-12	P-value
Mean	670	1612	2333	2643	4465	***
N(%)	247 (42.7)	284(51.4)	281 (49)	291(52.4)	288 (50.4)	
Euro/year	6.7	16.12	23.33	26.43	44.65	
Euro/day	0.018	0.044	0.064	0.072	0.122	
% yearly increase		140.6	44.73	13.29	68.94	NS
% increase from baseline		140.6	248.21	294.48	566.42	**

Significant at 5% level; *Significant at 1% level; NS=Not significant; N=No. of women; 1 Euro = 100 Tk

Table 3 renders the information about the household income for homestead gardening where the income getting beneficiaries increased from 42.7% to 51.4, 49.0, 52.4 and 50.4 and, average yearly income became highly significantly increased ($F=5.06$; $P\text{-value}< 0.01$) from baseline BD Tk. 670 (or 0.018 Euro/day) to 1612 (or 0.044 Euro/day), 2333 (or 0.064

Euro/day), 2643 (0.072 Euro/day) and 4465 (0.122 Euro/day) at the end of four years whereas yearly increased from baseline were significantly increased ($t= 3.45$; $P\text{-value}<0.05$) to 140.60, 248.21, 294.48 and 566.42% and, increasing from previous years were 140.60, 44.73, 13.29 and 68.94%.

Table 4. Descriptive statistics of household total income from all three activities

	Base	2008-09	2009-10	2010-11	2011-12	P-value
Mean	2800	4485	6434	7487	10690	***
N(%)	483(82.7)	550(94.2)	551(94.3)	550(94.2)	559(95.7)	
Euro/year	28	44.85	64.34	74.87	106.9	
Euro/day	0.077	0.122	0.176	0.205	0.292	
% yearly increase		60.18	43.46	16.37	42.78	**
% increase from baseline		60.18	129.79	167.39	281.79	**

Significant at 5% level; *Significant at 1% level; NS=Not significant; N=No. of women; 1 Euro = 100 Tk

Table 4 gives the data on total household income from all three activities whereas, income getting beneficiaries increased from baseline 82.7% to 94.2, 94.3, 94.2 and 95.7 in the successive years. Average income, at individual level, highly significantly increased ($F=18.24$; $P\text{-value}< 0.01$) from baseline BD Tk. 2800 (or 0.077 Euro/day) to 4485 (or 0.122 Euro/day), 6434 (or 0.176 Euro/day), 7487 (0.205 Euro/day) and 10690 (0.292 Euro/day) and, % of yearly increasing income from baseline were significantly increased ($t= 3.45$; $P\text{-value}<0.05$) to 60.18, 129.79, 167.39 and 281.79% and, increasing % of income from preceding years were also significant ($t= 4.50$; $P\text{-value}<0.05$) reached to 60.18, 43.46, 16.37 and 42.78%.

Discussion

From this study, it was evident that, integrated small-scale agriculture is a tool to improve the socioeconomic and food security status of women and hence empowered them in their family and society. Number of women getting income from

small-scale agriculture increased in successive years and income of individual beneficiaries increased significantly from baseline. As there was increasing production in three sectors, there were availability of vegetables, fish and poultry meat in the household which is in agreement with the statement of DFID (2004) stated as agricultural development is a tool in reducing poverty and improving food security in this areas. Further more, integrated crops, livestock, and aquaculture can be used for potential yield improvements and monetary advantages as well as positive implications for food security, dietary balance, and nutrition (Uddin and Takeya, 2006). In addition, it was stated that family poultry specially acts as an income source and employment of women (Gujit, 1994; Fattah, 2000; Islam *et al.*, 2014). To sum up, family income became increased from selling of vegetables, fish and poultry, nutrition security increased through household production, and unemployment will be reduced through the self-employment.

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