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Poverty and food security analysis of handloom weaver households in a selected area of Bangladesh

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Abstract

Handloom industry is the most important cottage industry in Bangladesh but many of the handloom weavers are in vulnerable situation. Poverty and food security are intricately interlinked and it should be analyzed in different dimensions. This study was conducted to assess the calorie intake level, determine the factors influencing calorie intake and identify the problems faced by the handloom weaver households in a selected area of Bangladesh. A sample size of 100 households was selected randomly from six villages. Data were collected through field survey by using pre-designed and pre-tested interview schedule. To assess the per person per day calorie intake level of the sample household's members, the food consumption data of seven days was measured by standard value of 100 gm each food item. To determine the factor influencing calorie intake multiple regression analysis was carried out. Calorie intake level and food consumption scores were used to measure poverty and food security. According to calorie intake level 15 percent of the handloom weavers belonged to hardcore poor whose average calorie intake was 1698.13 k.cal, and 46 percent weaver belonged to absolute poor whose average calorie intake was 2078.36 k.cal, and the rest 39 percent of the respondents belonged to non-poor whose average calorie intake was 2251.77 k.cal. Food consumption scores unveiled that 6 percent weaver households had poor food consumption while 39 percent weaver households had borderline food consumption; 31percent had acceptable low food consumption and 24 percent weaver households had acceptable high food consumption. Income of the household and cultivable area have positive impact on calorie intake of the household's members. Among the reported problems low wage rate was ranked the main problem faced by the handloom weavers. Bangladesh Handloom Board, government and non-government organizations, and institutions can take specialized policies for handloom weavers to reduce poverty and strengthen food security.

Introduction

Handloom industry in Bangladesh is having splendid history, uncertain present and indistinct future due to various factors that are acting behind the scene. Handloom industry is the largest handicraft industry in Bangladesh; it is the second leading source of rural employment after agriculture (Ahmad, 1999). There are about 183512 handlooms weaving units with about 505556 looms. The total equipped looms are 311851, which are about 68% of total looms, and the rest 193705 looms are outdated in Bangladesh (Liton *et al*. 2016). But now, handloom industry in Bangladesh faces many challenges. Number of handlooms decrease day by day. Besides this, due to extreme competition with lucrative power loom, the number of unneeded loom increases. Handloom industry in Bangladesh contributes about 63% of the total cloth production in the country designed for domestic consumption as well as export, meeting 40% of the domestic demand for fabrics, it also provides employment opportunities to thousands of rural male and female. Handloom industry plays crucial role to reduce poverty and increase households' income and expenditure in the country. Therefore, in Bangladesh, handloom sector has heartening role to solve unemployment problem and economic development (Liton *et al*. 2016).

Poverty alleviation is the center issue in the development dialogue (Rahman, 2006). With others areas, end poverty in all its forms everywhere, end hunger, achieve food security and improved nutrition of the citizen of a country are the focused areas in Sustainable Millennium Development Goals (SDGs). If we need to achieve the SDGs by 2030, we need to focus on poverty of all groups of people considering the importance of " poverty analysis should focus on an individual's potential to function rather than the results the individual obtains from functioning" (Sen,1999b). Handloom weavers' poverty should be seen as the deprivation of basic capabilities rather than merely as lowness of incomes, which is the standard criterion of identification of poverty; the instrumental relation between low income and low capability is variable between different communities and even between different families and different individuals (Sen,1999a).

Poverty and food insecurity have been prime disquiet in the recent times in Bangladesh (Rahman *et al*. 2013). Poverty and food security of handloom weavers are essential areas need to give attention for improvement of their livelihood. Sustainable development and food security in poor countries cannot succeed in the long-term without qualified individual poverty analysis (Bryant, 2005). When we discuss about the food

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security, we need to consider all the elements of food security such as availability, accessibility, utilization and sustainability. So, ensuring food security for everyone is very complex and difficult which Bangladesh faces now-a-days.

In spite of considerable achievements in food availability through food grain production, food security at all levels such as national, household and individual remains an issue of most important fear for the government of any country. Regardless of the increase in food production and its availability, food insecurity as well as poverty is still a key problem mainly because of not having purchasing power particularly for the poorest group of people. Poverty rate has dropped to 24.3 percent. According to the latest survey results, the poverty rate in rural areas was 26.4 percent, while urban poverty was 18.9 percent (HIES, 2016). The current rate of extreme poverty is 12.9 percent, compared to 17.6 percent six years ago (BBS, 2017). A huge number of households keep their food consumption to a small number of food groups, namely cereals (mainly, rice), wheat, oil, vegetables, and fish. The consumption of this food basket is insensitive to poverty status, that is, households across all poverty strata consume a similar mix of food groups. In general, while households' consumption of meat products, milk, and eggs is limited, higher income groups are more likely to consume fruits and meat products (Rabbani, 2014).

We can see from HEIS, 2016 and BBS, 2017 reports that Bangladesh is a right way to trim down poverty and attain food security for its citizens. As a large number of labor forces are engaged in handloom industry in Bangladesh (Ahmad, 1999). If we can identify their poverty, food security situation and problems faced by the handloom weavers, we can make proper policy for them. Considering those facts the major research questions were; what are their food consumption level? What factors influencing their consumption? and what are the problems faced by the them regarding handloom operations? On the basis of the research questions, this research was focused on to measure the calorie intake level of the sample households' members, identify factors influencing calorie intake, and to analyze the problems faced by the handloom weaver regarding handloom industry.

Materials and Methods

Handloom industry did not develop equally in all regions of Bangladesh. It is intense in some areas where inputs are available, easy to marketing and infrastructure facilities. Sirajgang district has the highest number of establishments (Liton *et al*. 2016) (see Appendix-I). For this reason, Sirajganj district was purposively selected for this study. The study was conducted in six villages namely: Kaizuri, Sonatola and Gudhibari from Shahzadpur *upazila* and Pachlia, Raninagar and Tarutia under Ullapara *upazila*. Random sampling was applied for sample selection for conducting the field survey. A total of 100 weavers were interviewed using pre-designed interview schedule. The respondents were briefed about the objectives of the study before going to make actual interview. Interviews were normally taken place at the weavers' house in their leisure time. At the time of interview, questions were asked systematically and explained whenever, it was felt necessary. Weavers usually do not keep any records of day to day transaction of their daily life and weaving activities. In order to minimize errors, data were collected in local units. However, these local units were later converted into standard international units at the time of data processing.

To assess the calorie intake level of the sample households' members, the consumption data of handloom weaver households of seven days was measured by standard value of 100 gm each food item. For the calculation, family members are defined as one adult male and one adult female is 1:1, the child whose age is below 5 years considered as zero and 5 – 10 years considered as half of an adult member.

To estimate the factors influencing calorie intake the specified regression model (Gujrati,1995) has been developed as follows:

$C = \alpha_+ \beta_1 I + \beta_2 E + \beta_3 A + \beta_4 F + \beta_5 C + \mu_i$ ..... (i)

Where,

C = Calorie intake per day per person
α = Constant term
I = Income of the household
E = Education level of the respondent
A = Age of the respondent
F = Family size
C = Cultivable Area
μ_i = Error term

Food Consumption Scores (FCS)

In order to measure food security, food consumption score (FCS) was used in this study (WFP, 2009). In the Table 1 describes the food groups and their weight through calculation steps.

Table 1. Food groups and their weight

	Food items (examples)	Food groups (definitive)	Weight (definitive)
1	Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals Cassava, potatoes and sweet potatoes, other tubers, plantains	Main staple	2
2	Beans. Peas, groundnuts and cashew nuts	Pulse	3
3	Vegetables, relish and leaves	Vegetables	1
4	Fruits	Fruit	1
5	Beef, goat, poultry, pork, eggs and fish	Meat and fish	4
6	Milk yogurt and other diary	Milk	4
7	Sugar and sugar products	Sugar	.5
8	Oils, fats and butter	Oil	.5
9	Spices, salt, fish power, small amounts of milk for tea.	Condiments	0

Source: WFP, 2009

Bangladesh Specific FCS Threshold

Given the significance of oil and fish in the diet of the Bangladeshi people, these thresholds were elevated (WFP, 2009). As a result, FCS thresholds were revised for Bangladesh and four food consumption groups were created:

- Poor consumption (≤28),
- Borderline Consumption (>28 and ≤42),
- Acceptable Consumption (>42).
- An additional threshold was introduced to distinguish the acceptable households between acceptable low (43-52) and acceptable high (>52).

To compare the food security status of handloom weavers on the basis of national level indicator the testing procedure was as follows:

Proportion Test

The null and alternative hypotheses are:

H_0: $P \leq P_0$ vs H_1: $P > P_0$

H_0 is the null hypothesis that the proportion is P_0

H_1 is the alternative hypothesis that the proportion is P

Under the null hypothesis the test statistics is

$$Z\text{cal} = \frac{P - P_0}{\sqrt{p_0 q_0 / n}}$$

Where, $q_0 = 1-p_0$

Where, p = sample proportion

p_0 = hypothesize population proportion

n= sample size

If Zcal≥ Z_α, null hypothesis can be rejected at α% level of significance, otherwise accepted (Rahman *et al.* 2016).

Results and Discussion

Calorie Intake

Considering the amount of food consumed by the respondents and their family members per person per-day calorie intake was calculated. The sample households were asked about their last 7 days food consumption amount like how much rice, fish, meat vegetables, how many eggs, fruits consumed. After collecting that information we converted all the consumed food amount into calorie, then we calculated per capita per person calorie intake level. It was classified into the following four categories in Table 2.

Table 2. Calorie intake by the sample households

Categories	Number of respondents	Per Person Per day Average Calorie Intake (k.cal)
Ultra Poor (<1600kcal)	0	-
Hardcore Poor (<1805kcal)	15 (15%)	1698.13
Absolute Poor (<2122 kcal)	46 (46%)	2078.36
Non- Poor (Above 2122 kcal)	39 (39%)	2251.77

Source: Authors Estimation. Figures within parentheses indicate percentages of total.

There was no respondent belonged to ultra poor(<1600 k.cal). About 14% of the respondents belonged to hard core poor (<1805 k.cal) whose average calorie intake was 1698.13 k.cal and 46% of the respondents had an average calorie intake 2078.36 k. calories and they belonged to absolute poor. The rest 39 % of the respondents took above 2122 k.cal. and average calorie was 2251.77 k.cal. Therefore, the maximum number of respondents belonged to the hard core poor.

Individual Food Intake

Food consumption vary one group to another. This section compared the food consumption level of handloom weavers with national average. Per capita per day food consumption of handloom weaver was presented in Table 3. The table reflects that rice was the highest amount of food intake which was 588.39 gm per person per-day and it was 72.23 gm more than the national average. The table reveals that the weavers consume wheat, meat and egg less than the national average. Per capita per day fish intake was 94.38 gm household level while it was 44.65 gm at national level. They consumed fish 49.73 gm more than that of national level because of availability and affordable price of fishes. They also consumed pulse, milk and fish more than the national level average consumption. From above comparison we can observed that some food items like wheat, meat and egg were consumed less than national average. If the government policy is to ensure food and nutritional security of all group of people in Bangladesh, policies should be formulated on the basis of the local demand.

Table 3. Food intake per person per day

Major food items	Per person per day food intake (gm/person/day)	National Average per person per day food intake (gm/person/day)	Difference between national average
Rice	588.39	516.16	+72.23
Wheat	15.28	45.21	-29.93
Potato	151.15	96.45	+54.70
Vegetables	120.33	109.58	+10.75
Pulses	15.92	9.86	+6.06
Meat	12.41	23.24	-10.83
Egg	5.18	8.03	-2.85
Milk	32.76	21.64	+11.12
Fish	94.38	44.65	+49.73

Source: Field Survey, 2017

Food Consumption Scores

Food consumption scores of sample household were presented in Table 4. There were 6% household having poor food consumption and 39% having borderline food consumption. About 31% weaver households had satisfactory low food consumption and only 24% households have satisfactory high food consumption.

Factors Influencing Calorie Intake

The independent variables used in explaining the caloric intake function were household's income, education of the respondent, age of the respondent, family size and cultivable land area. All the independent variables influenced on food consumption by the handloom weaver households. Co-efficient of multiple determination (R^2) indicated the total variations of output explained by the independent variables; F-value was used to measure the goodness of fit for different types inputs.

Table 4. Percentage of food consumption score by the sample household

Profiles	No. of respondents	% of total
Poor consumption (≤28)	6	6
Borderline Consumption (>28 and ≤42)	39	39
Acceptable Consumption low (43-52)	31	31
Acceptable Consumption high (>52)	24	24
Total	100	100

Source: Field Survey, 2017

Table 5 indicates that the intercept term was positive. The intercept in a multiple regression model is the mean for the response when all of the explanatory variables take on the value 0. The value of the coefficients of income of the household, education of respondent and cultivable area of the respondent were positive with individual calorie intake. The handloom weaver households who had more income they purchased more foods and consumed more. Similarly, the respondents who were more educated they had more knowledge about the nutrition of the food items and consumed more nutritious foods, and the respondents who had more cultivable area they produced more foods in their field as a results, their own foods were more that leads to more food consumption. On the other hand, age of the respondent and family size of the household coefficients were negative with individual calorie intake. The respondents whom age was more they were not so interested to buy more foods for their family that leads to negative calorie intake. Similarly, when family size was large, share of the limited food items was small.

Table 5. Estimated coefficients and related statistics of the linear regression

Variables	Coefficient	t-values
Constant	1208.48**	17.643
Income of the household	0.0101**	8.687
Education level of the respondent	5.51	0.527
Age of the respondent	- 1.9	-0.624
Family size	-15.86	-1.029
Cultivable Area	0.897*	3.079
R^2	0.690	
Adjusted R^2	0.669	
F	90.431**	

***** * and * indicate significances at 0.01 and 0.05 probability level, respectively.

Problems Faced by the Weavers

The weavers were having a variety of challenges like capital constraint, incapability to acquire modern machineries, unfavorable working environment, low wages, increased price of input, lack of government support, not have of adequate domestic market and domestic demand (Roy and Chouhan, 2017).

Food security of handloom weaving households is hampered as weavers face many problems pertaining to the weaving, their working environment and payment (Mamidi *et al.,* 2017). In this research, the handloom weavers faced five types of problems such as: low wage rate, no overtime payment, health risk, unhealthy working environment, and delay payment of wage were found. However, this sector was faced with various problems, such as outdated machinery, indecent production structure, low output, insufficient operational capital, usual product variety, and fragile marketing links. Further, handloom sector has always been a weak competitor against power-loom and mill sectors (Raju and Rao, 2014).

Wage was usually paid to the weavers on weekly basis. Weavers work on a fixed wage rate, which was very low according to them and comparing with other works. About 45% weavers claimed low wage rate as their first problem, which was maximum while 34%, 11%, 4% and 6% weavers ranked low wage rate as their second, third, fourth and fifth problem, respectively. So, it obviously was weavers' top problem according to Table 6. Handloom weavers income was very low; it was very difficult for them to survive in the inflationary market economy. It was very high time to review their wages (Jahan and Kumkum, 2016). About 48% weavers voted no overtime payment as their fifth problem; this was the maximum percentage for this problem. The table also reveal that, 6%, 16%, 12% and 18% weavers thought that no overtime payment is their first, second, third, and fourth problem, respectively. Health risk of the handloom weavers was another problem. About 31% weaver claimed it was their third problem, whereas 12%, 12%, 30% and 15% weavers said it was their first, second, fourth and fifth problem, respectively. About 34% weavers ranked bad working environment as their fourth problem whereas 9%, 18%, 24%, and 15% weavers claimed it was their first, second, third and fifth problem, respectively. Delay payment of wage was another problem for handloom weavers. About 20% of the weavers reported it was their second problem, whereas 28%, 22%, 14% and 16% weavers reported it was their first, third, fourth and fifth problem, respectively.

Table 6. Ranking of problems faced by weavers

Problem	Number of times problem was ranked					
	First	Second	Third	Fourth	Fifth	Total
Low wage rate	45	34	11	4	6	100
No overtime payment	6	16	12	18	48	100
Health risk	12	12	31	30	15	100
Bad working environment	9	18	24	34	15	100
Delay payment of wage	28	20	22	14	16	100

Source: Field Survey, 2017

Proportion Test: Compare to National Level

H_0: P≤.243 VS H_1: P>.243

The test statistic is : $$Z = \frac{P - P_0}{\sqrt{\frac{p_0 q_0}{n}}}$$

$$= \frac{61 - 0.243}{\sqrt{\frac{0.243 \times .757}{200}}} = 8.55687$$

At 5% level of significance, We may conclude that H_0 can be rejected.

Now, Though government say that 24.3% citizen of the Bangladesh are poor, for handloom weavers, the value was significantly high that was 61%.

Conclusion

Achieving food security for all of the citizens is one of the most important challenges for present Bangladesh. The study found that most of the handloom weaver households were living with poverty and food insecurity. Majority of them were absolute poor and hard core poor having poor and average food consumption. It could be concluded from the above discussion that they were very poor and they were suffering from food insecurity. Considering the national average food consumption, it was found that the weaving households had wheat, meat and egg less than the national average consumption whereas rice, vegetables, potato, pulses, milk and fish had more than the national average consumption.

The handloom weavers were facing different problems such as low wage rate, no overtime payment, health risk, unhealthy working environment, and delay payment. For ensuring food security and reducing poverty of handloom weavers policy maker should formulate the wage rate policy for the handloom weavers on the basis of their expenditure on basic needs. As the weavers worked more than their daily working hours, they should be paid by the handloom owners as an overtime. If the handloom owners are not agree on this, the government should take necessary action on this. The handloom owners should take care the handloom weavers when they are injured in their working place. Every worker has right to have healthy working environment. For ensuring the healthy working environment, government should make monitoring cell for the handloom industry. Most importantly, payment should be on time. As the weavers are poor, they are waiting for their salary after end of the payment date, if they could not get their salary on time they are not able to buy their daily needs. So, the government and others relevant authorities should focused on those problems.

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Appendix-I

Ranking of districts by handloom

District	Establishments	Looms	Ranking
Sirajgang	14870	143858	1
Tangail	6476	37222	2
Pabna	7434	35119	3
Narsingdhi	7247	26693	4
Kushtia	11927	22348	5
Narayangang	5178	14743	6
Dhaka	5448	13604	7
Brahmanbaria	3944	10505	8
Bogra	3877	5446	9
Comilla	3090	4696	10
Total	69491(37.9)	314234(62.2)	

Source: BBS,2005 (Handloom Census, 2003)
Note: The table excludes handloom establishments and looms in Chittagong and the figure in bracket of the last row shows the Percent of Bangladesh.

Appendix-II

List of calories of different food items

Food items	Amount	Calorie
Rice	100 gm(uncooked)	372
Flour	100 gm	340
Potato	100gm	77
Chicken	100 gm	110
Beef	100 gm	187
Tomato	100gm	18
Pulse	100gm	14
Korola	100gm	17
Brinjal	100gm	25
Leafy Vegetables	100gm	49
Egg	1 pc medium	78
Milk	100ml	44
Fish	100gm	100
Apple	100gm	52
Orange	100gm	47
Banana	1 pc medium	105
Pineapple	100gm	50
Guava	100gm	68
Grape	100gm	67

Source: FAO, 2008 (http://www.fao.org/docrep/006/Y5022E/y5022e04.htm).