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Female Headed Household in Bangladesh: An Alternative Approach to Attain Food Security

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Abstract

Attaining food security remains as a foremost apprehension in the development endeavour of Bangladesh. The country has been successful in evading hunger through its policies of feeding the people more specifically with cereal. The Constitution of Bangladesh [Article 15(a)] recognizes the fundamental responsibility of the state is to secure to its citizens the provision of the basic necessities of life including nutritious foods. Bangladesh has been successfully able to attain food security for its people emphasizing only on increasing foodgrain availability. In the last three decades, even as its population has more than doubled, foodgrain availability has kept pace with population growth. Heavy dependence on foodgrain makes the people remain nutritionally in poor condition. This situation epitomize that there is disconnect between food policy of feeding the people with foodgrain and nutrition. Therefore to achieve food security in actual sense emphasis should be given on nutrition. Percentage of female headed household in Bangladesh is rising and it was 12.5% in 2014. Considering this view present study examine the impact of female headed household on the intake of major macronutrients i.e. carbohydrate, protein and fat and micronutrients i.e. vitamin. In the paper, to estimate the parameter the secondary data from the Household Income and Expenditure Survey (2010) of Bangladesh has been used. The data set included daily data on food consumption for consecutive 15 days for 12,240 households. To estimate the parameters both Seemingly Unrelated Regression Equation (SURE) and Ordinary Least Square (OLS) has been used in the paper. It is found that female headed households have negative and significant impact on carbohydrate intake and positive and significant impact on fat intake. However female headed households have no such impact on protein and vitamin intake. It is also found that from policies point of view these households will perform better.

Keywords: *Food Security; Female Headed Household; Consumption Pattern and Nutrients*

Introduction

Envoys from more than 180 countries met to declare their commitment to an enduring effort to eradicate hunger in all countries and set the near-term goal of halving the number of undernourished people by 2015 in 1996 at the World Food Summit in Rome, Italy. This Summit was not the first attempt to espouse international support to address hunger. Writing in 1995, Pinstrup-Andersen et al. (1995, cited in Shaw and Clay 1998:56) estimated that more than 120 international declarations, conventions and resolutions have been reached on various issues relating to the right to food. That right to food and the elimination of hunger were enshrined in the Universal Declaration of Human Rights, adopted at the UN in New York in 1948; in the Universal Declaration on the Eradication of Hunger and Malnutrition, passed at the World Food Conference in Rome in 1974; and in the World Declaration on Nutrition, approved at the International Conference in Rome in 1992.

Food security and adequate nutrition are the basic needs of every human being. The Constitution of Bangladesh [Article 15(a)] recognizes the fundamental responsibility of the state is to secure to its citizens the provision of the basic necessities of life including nutritious foods. The Commission on Human Rights has repeatedly affirmed that hunger constitutes a resentment and a violation of human dignity. Bangladesh is a signatory to the Vienna Declaration and Program of Action adopted by the World Conference on Human Rights in 1993 and has expressed its commitment to implementing the Declaration on the Right to Development adopted by the United Nations in 1986. Moreover, Bangladesh has made legally binding commitment to execute the right to development through ratifying International Covenant on Economic, Social and Cultural Rights (ICESCR) in 1998. This is the most important human rights instrument for the right to food as it enshrines the right to food and the right to be free from hunger in its article 11.

Bangladesh has been successfully able to drive on the road of its efforts to attain food security for its people emphasizing only on increasing foodgrain availability. In the last three decades, even as its population has more than doubled, foodgrain availability has kept pace with population growth (Osmani *et al*, 2016). The achievement is the result of combined effort of increase in cereal production especially rice, improved public food distribution system and timely import of foodgrains. Although there are still important shortfalls in the production of certain non-cereal crops as well as some non-crop foods relative to demand, but overall it is fair to say that Bangladesh has attained food self-sufficiency based on cereals at the aggregate level—at least in terms of calorie availability. This is evident from the fact that per capita per day calorie intake in 2010 was 2,318 kcal (HIES 2010), which was comfortably higher than the estimated minimum requirement of 2,122 kcal per capita per day.

Despite the impressive achievement an alarmingly large number of people still remain food insecure and hungry. Using a composite index of several dimensions of food insecurity, a recent study found that one-quarter of the population was food insecure in 2014, which amounts to 40 million people in absolute number and among them; some 11 million people were found to suffer from acute hunger (Osmani *et al*, 2016). According to the Global Hunger Index, an internationally comparable composite indicator of nutritional status, Bangladesh's situation was found to be in the "serious" category in 2014.

The gender vision of the Eighth Five Year Plan (2020-25) is that of establishing "a country where men and women will have equal opportunities and rights and women will be recognized as equal contributors in economic, social and political development". The mission is to ensure women's advancement as self-reliant human beings and reduce discriminatory barriers by taking both developmental and institutional measures. Gender issue also acquires prominence in the Sustainable Development Goals (SDGs). SDG adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart there are the seventeen Sustainable Development Goals (SDGs) of which goal two and five are about food

security and gender issue. Goal two states that to end hunger, achieve food security and improved nutrition and promote sustainable agriculture. Goal five affirms that to achieve gender equality and empower all women and girls. These indicate that right to nutritious food for the women is recognized in these documents.

The household is a vital unit for economic analysis of consumption and decision-making. In policy planning for improving nutrition and the targeting poverty in developing countries, the household represents the smallest social and economic unit of analysis of dietary intake and calorie distribution. It is recognized, however, that within a household, there are intra-household dynamics that arise from how the head of the household allocates resources and makes consumption decisions. Female headed households are historically, socially and economically considered as the most vulnerable and deprived section of a country. In almost everywhere females are disadvantaged relative to men in their access to assets, credit, employment, and education. Consequently, it is often assumed that female-headed households are poorer than male-headed households, and are less able to invest in the health and education of their children (Folbre, 1991).

Female-headed households are over-represented by widows, divorced or separated women and are smaller, have fewer children and have heads that are less likely to be working. When working, they work for a lesser period in a year and in lower category of occupation, and female heads are less likely to be literate. Moreover, female-headed households are less likely to own land and modern consumer goods and are more likely to be in poor living conditions. All these factors indicate that female-headed households are poorer than male-headed households (Mannan, 2000).

Female headed households in Bangladesh spend three fourths of their income on food (Mannan, 2000). Therefore, female headed households tend to have a positive influence on the relative nutritional status of children than male headed households. The difference in food expenditure patterns of female headed households and male headed households depend on cultural gender roles, biological attachment to household members, and economic hardship faced by the household (Ngwenya, 2008). Since female headed households own relatively small land holding their returns from land are low. Again they have less access to credit which can support many other alternative livelihood strategies such as income generating activities including small business. Together these make female headed households more food insecure.

Literature Review

It is widely assumed that female-headed households experience higher rates of poverty compared to male-headed households (Buvinic and Gupta 1997). In their review of 66 studies concerning female headship and poverty for example, Buvinic and Gupta (1997) concluded that in two thirds of the cases female-headed households were poorer than male-headed households. There is an argument that female headed households may be increasing disproportionately among poorer sections of the community. According to Cain et al (1979), pauperization produces a shift from the extended to the nuclear family which in turn creates more female headed households.

The positive association between female headship and poverty is presumably due to several factors. Compared to male-headed households, female-headed households tend to have a higher dependency ratio and a greater number of non-workers. In addition, men on average earn more than women, largely because women are typically employed in the informal sector of the economy. Moreover, in female headed households where there is no other adult present, the household head is not only responsible for generating income but also for completing domestic tasks. By restricting mobility and limiting the amount of available free time, the burden women carry can reduce the income generating opportunities for female-headed households. The disadvantages women confront are thought to apply, a

fortiori, to lone heads of domestic units. Lacking a male partner, women are deprived of an adult male's earnings, and are unable to avail themselves of the non-market work that a wife usually provides in a male-headed unit. Women who head households also have smaller social networks, and, by virtue of bearing the full weight of household responsibilities, are confined to part-time, home-based occupations (Chant 2008).

The inventory of disadvantages that women face has promoted the conclusion that female-headed households throughout the world figure among the "poorest of the poor." Yet this blanket conclusion runs counter to a growing body of research that suggests that members of female headed households are not necessarily worse off than their male-headed counterparts (Chant 1997). The counter argument to the poorest-of-the-poor thesis rests mainly on two observations, one of which points to the various ways that the relationship between female headship and poverty can be offset by the household's internal composition (Folbre 1991). The presence of other adult earners in the labor force or the presence of elderly pensioners can add to household income. Similarly, co-resident extended kin can also reduce vulnerability by bolstering income-earning capacity and by increasing the supply of people prepared to share the burdens of household maintenance. Older children in the household, who can take on child care responsibilities of younger siblings, can also free up the amount of work time available to adult women (Chant 1997).

Even when female headed households have lower incomes than male-headed households, the detrimental effects of low income can be offset by the extent and manner in which income and assets are converted into consumption. A number of studies have found that women devote the bulk of their earnings to household expenditures, and that their spending pattern has positive effects on other members' welfare (Chant 2003; Folbre 1991; Molyneux 2006; Thomas 1990). Men, by contrast, are prone to retain more of their earnings for discretionary personal spending on drinking, gambling, and other individualistic pursuits. Analyses of survey data on family health and nutrition in Brazil similarly found that income in the hands of a mother has a bigger effect on her family's health than income under the control of the father. For child survival probabilities, the effect was almost twenty times larger (Thomas 1990). Systematic gender differences in the pattern of household resource could mean that children and other members of female-headed households may be better off than their counterparts in male-headed households.

Frazao, E. (1993) found that households headed by single mothers spend less money, but a greater share of their income, on food than do two-parent households. The lower spending is due primarily to their lower income and education levels- more so than to the absence of a male partner. This, however, does not necessarily imply that these households have lower food consumption or nutrition.

Food insecurity is higher among female-headed households compared to male headed households. Again both moderate and severe food insecurity increases with additional adult males but decrease with additional adult females. Evidence that the presence of adult females reduces food insecurity is consistent with studies of gender differences in household decision making which show that, compared to men, women's spending patterns have a greater positive effect on the welfare of children and other members of the household (Kantor and Wood, 2012).

Chindime and Jaswa in case Malawi found that poor nutritional status is slightly more prevalent among children from female headed household compared to those from male headed household but the difference is not statistically significant. Ngwenya, (2008) found in Vietnam that female headed household have lower mean calorie intake than male headed household.

Methodology

The Model

In his paper titled, "A New Approach to Consumer Theory" (Lancaster, 1966) Kelvin Lancaster explained Characteristic Demand Theory in 1966. According to this theory, consumer derives utility not from actual contents of their consumption basket but from the characteristics of goods in it. This new approach helps to predict how preferences will change when consumers change their options or baskets presented to them. This is particularly true for food where utility from food is not derived from a product but from their composition of products. In Lancaster's New Approach it has been shown that consumer maximizes utility via consumption of a bundle of characteristics of the products. This is shown in the following expressions:

Consumer's choice under Lancaster's approach can be written (for two products) as

Maximize $U(\alpha_1, \alpha_2, \alpha_3 \mid \theta)$ subject to $M = P_1X^*_1 + P_2X^*_2$ and so (1-1)

$\alpha_i = f(X_1^*, X_2^*, \theta) \quad \forall\, i = 1, 2, 3$ is the attribute production function. (1-2)

where, X's are goods and services consumed by the consumers, θ is other individual characteristics (social, cultural, etc.), M is income (wage and non-wage) and P's are prices of the goods and services and αi is the attribute i derived from consumption of X*'s (adapted from Nicholson, 2012)

Lancaster's approach is designed to derive production function of food characteristics which is made up from the consumption bundles. As such according to this theory, consumer consumes food to derive utility from different food attributes such as carbohydrate, protein, fat, vitamin and they combine different food items in order to acquire these attributes from their food. Lancaster's approach, therefore, determines consumer's choice using the Household Production Model where consumed goods are combined as input to produce utility providing outputs (attributes). As a result, attributes are the functions of the goods and services consumed by the household.

Assuming X, Y and Z are the three food products consumed by a household, and assuming that α_1, α_2, α_3, and α_4 are different food elements such as carbohydrate, vitamin, protein and fat, it is possible to derive a system of equations that explains intake of food elements in terms of their choice of food items, that is,

$\alpha_i = f(X^*, Y^*, Z^* \mid \text{other household characteristics}) \quad \forall\, i = 1, 2, 3 \text{ and } 4$ (1-3)

Where X*, Y* and Z* are the optimized bundle of consumption of X, Y and Z from the market.

Lancaster used a linear attributes model and his attribute production equations are shown as

$\alpha_i = \delta_{1x}X^* + \delta_{2y}Y^* + \delta_{3z}Z^* \quad \forall\, i = 1, 2, 3 \text{ and } 4$ (1-4)

Lancaster's production approach is particularly useful to study how consumer's choice of food items eventually produces the attributes needed for maximizing satisfaction at the household level.

The Method of Estimation

To estimate the parameters both Seemingly Unrelated Regression Equation (SURE) and Ordinary Least Square (OLS) has been used.

Sources of Data

In the paper, to estimate the parameter the secondary data from the Household Income and Expenditure Survey (2010) of Bangladesh has been used. The data set included daily data on food consumption for consecutive 15 days for 12,240 households. Nutrition data are taken from Bangladesh Health and Demographic Survey.

Discussion and Results

Head of household means a member of the household who is the decision maker regarding different activities of the households. Generally the head of the household is the main earner and the household run under his/her command. In Household Income Expenditure Survey (HIES) 2010 a member is regarded as head of household whom the other members consider him/her so. If a female member of household has these characteristics then that household is called female headed household. There are 1,749 female headed households in HIES 2010. Number of female headed households as per the classification is given below.

Table 1: Number of Female Headed Households as per Their Characteristics

Household Classification	Currently Married	Never Married	Widow	Divorced	Separated
Number	731	09	911	34	64
Percentage	41.80%	0.51%	52.09%	1.94%	3.66%

Source: Household Income Expenditure Survey 2010

Among the female headed household highest percentage of households head are widow and lowest are never married. In 2020 percentage distribution head of household by type of residence is given below

Table 2: Percentage Distribution Head of Household by Type of Residence

Head of Household	Rural	Urban	Total
Female Headed Household	15.4	14.5	100
Male Headed Household	84.6	85.5	100

Source: Women and Men: Fact and Figures 2022

Female headed household are greater in rural areas compared to urban areas. On the other hand male headed household are greater in urban areas compared to rural areas.

The Head Count Rates (HCR) of incidence of poverty by using Cost of Basic Needs (CBN) method is found significantly less for the female headed households than that of men headed households. Using the upper poverty line, in 2016, the HCR of incidence of poverty by sex of head of household is estimated at 19.9% for the female headed household, whereas, it is 24.8% for the men heads. In the rural areas, HCR is 20.0% for the female head and 27.1% for the men head. In the urban areas, the HCR of men household is lower than female headed household. It is18.8% for the men headed households and 19.7% for the female headed households.

The Model for Analyzing the Food Consumption Pattern on Intake of Nutrients by Female Headed Household

People consume different foods for the attributes they contain according to Lancaster theory. It implies that people consume different foods because they encompass different nutrients like carbohydrates, protein, vitamin and fat. Present paper analyzes the impact on nutrient intake if the household head is female.

In methodology section, it has shown that Lancaster's approach to consumer behaviour can be used to derive the attribute production equation (equation 1-1 to 1-4) where each attribute of food (like carbohydrate, vitamin, protein, and fat) can be a linear function of the bundle of consumption of food items at the household level. In this study, we have slightly modified the equation since we assumed that female headed household (θ) are separable from the Marshallian demand equation. As such, the attribute equations are shown as

$$\alpha_i = f(X^*, Y^*, Z^*, \theta) \quad (1\text{-}5)$$

$\forall$ i = carbohydrate, vitamin, protein, and fat.

where we assumed that $X^* = f(P's, M, \theta) = f(P's, M) \times g(\theta)$

and X* is the utility maximizing choice of X's

The final empirical model for food attributes are shown below.

$$\text{Carbohydrate} = \alpha + \gamma_j (\text{Female Headed Households})_j + \varepsilon \quad (1\text{-}6)$$

$$\text{Vitamin} = \alpha + \gamma_j (\text{Female Headed Households})_j + \varepsilon \quad (1\text{-}7)$$

$$\text{Protein} = \alpha + \gamma_j (\text{Female Headed Households})_j + \varepsilon \quad (1\text{-}8)$$

$$\text{Fat} = \alpha + \gamma_j (\text{Female Headed Households})_j + \varepsilon \quad (1\text{-}9)$$

The parameters are estimated using both Seemingly Unrelated Regression Equations (SURE) and Ordinary Least Square (OLS) and the results are given in Table 3 and Table 4 below

Table 3: Regression Results (Seemingly Unrelated Regression Equation)

Dependent variable >>>>>>>>	**Carbohydrate (Kcal)**	**Vitamin (Kcal)**	**Protein (Kcal)**	**Fat (Kcal)**
Explanatory Variables				
Female Head of the Household =1, otherwise 0	-30.65***	1.436	1.379	7.853***
	(-3.333)	(1.042)	(0.630)	(3.334)

Table 1: Regression Results (Ordinary Least Square Regression)

Dependent variable >>>>>>>>	**Carbohydrate (Kcal)**	**Vitamin (Kcal)**	**Protein (Kcal)**	**Fat (Kcal)**
Explanatory Variables				
Female Head of the Household =1, otherwise 0	-32.66***	1.508	2.072	7.574***
	(-3.549)	(1.093)	(0.946)	(3.212)

Interpreting the Estimated Coefficient of Carbohydrate Equation When Head of Households Is Female

The carbohydrate equation is shown in Column 1 of Table 3 and 4. Coefficients of female headed household show how it influence intake of carbohydrate. A positive value indicates an increase in intake of carbohydrate due to increased value of the explanatory variable and a negative coefficient indicate a decrease in intake due to increased value of the explanatory variable.

The coefficient of carbohydrate to female head of the household is negative and significant. This means that if the household head is female then calorie intake from carbohydrate reduces. This also implies that households with female head consume less carbohydrate than the male headed households. In Bangladesh extent of poverty is more acute in female headed households and female workers earn less compared to their male counterparts for which their family member's carbohydrate intake is less than the male headed households.

Interpreting the Estimated Coefficient of Vitamin Equation When Head of Households Is Female

The vitamin equation is shown in Column 2 of Table 3 and 4. Coefficients of female headed household show how it influence intake of vitamin. A positive value indicates an increase in intake of vitamin due to increased value of the explanatory variable and a negative coefficient indicate a decrease in intake due to increased value of the explanatory variable.

The coefficient of vitamin to female head of household is positive but it is not significant. It means that there is no difference in the intake of vitamin at the household level based on the gender of the head of the household. This result is interesting given the fact that in case of carbohydrate intake (per capita) the coefficient was negative and so it shows that while female headed households take less carbohydrate it is not the case for intake of vitamin.

Interpreting the Estimated Coefficient of Protein Equation When Head of Households Is Female

The protein equation is shown in Column 3 of Table 3 and 4. Coefficients of female headed household show how it influence intake of protein. A positive value indicates an increase in intake of protein due to increased value of the explanatory variable and a negative coefficient indicate a decrease in intake due to increased value of the explanatory variable.

The coefficient of protein to female head of household is positive but not significant. It implies that there is no difference in protein intake at the household level in case of female headed households.

Interpreting the Estimated Coefficient of Fat Equation when Head of Households is Female

The fat equation is shown in Column 4 of Table 3 and 4. Coefficients of female headed household show how it influence intake of fat. A positive value indicates an increase in intake of fat due to increased value of the explanatory variable and a negative coefficient indicates a decrease in intake due to increased value of the explanatory variable.

The coefficient of fat to female head of household is positive and significant. It means that if the household head is female then fat intake will increase and if the household head is male fat intake will decrease. If other things remaining same female headed households take more fat than the male headed households.

Bangladesh attain food self sufficiency in 2010-11 which is mainly cereal based. In the food basket of Bangladeshi people percentage of carbohydrate is 68.7%, protein 6.5%, vitamin 3.8% and fat 7.9%. Desired level of carbohydrate, protein, vitamin and fat for the people of the country are 60%,

13.5%, 4% and 11% respectively. These percentages imply that people do not receive a desired diet nor a balanced diet. They take much higher carbohydrate and less protein and fat. To achieve food security people must have a balanced diet and to do that they must reduce carbohydrate intake and increase protein and fat intake especially. In this paper we have found that if the household head is female then carbohydrate intake will reduce and fat intake will increase. This entails that the female headed households response in a better way in the food policy. Again in case of significant positive changes in intake protein and vitamin it might be possible if the socio-economic condition of the female headed households can be changed.

Conclusion

'Food', the basic need for human survival initiated economic activities and sowed the seeds of civilization. Accomplishing food security remains as a major apprehension in the development endeavour of Bangladesh. The country has been successful in avoiding hunger through its policies of feeding the people more specifically with cereal. The Constitution of Bangladesh also states to ensure food and nutrition to its people. Bangladesh has been successfully able to attain food security for its people emphasizing only on increasing foodgrain availability. In the last three decades, even as its population has more than doubled, foodgrain availability has kept pace with population growth. Heavy dependence on foodgrain makes the people remain nutritionally in deprived condition. In Bangladesh percentage of children with low birth weight is 22% (WHO, 2012) and children suffering from stunting, wasting and underweight is 41%, 16%, and 36% respectively (Bangladesh Demographic and health Survey, 2011). On the other hand percentage of women suffering from thinness is 30% i.e. women have BMI less than 18.5, short stature 13% and underweight women 24% (BDHS, 2011). This situation exemplify that there is disconnect between food policy of feeding the people with foodgrain and nutrition. Therefore to achieve food security in actual sense emphasis should be given to nutrition.

Female headed household in Bangladesh is rising. According to Bangladesh Bureau of Statistics during the two decades from 1994 to 2014 the percentage female headed households increase from 8.7% to 12.5%. In addition to these female headed households are the most vulnerable, disadvantaged and poor. They have limited access to employment, asset, credit facility, education and other social and economic facilities. Since they populate a considerable amount and face many socio-economic problems compared to their male counter parts accomplishing food security by them must receive extensive attention. Considering this view present study examine the impact of female headed household on the intake of major macronutrients i.e. carbohydrate, protein and fat and micronutrients i.e. vitamin. In the paper, to estimate the parameter the secondary data from the Household Income and Expenditure Survey (2010) of Bangladesh has been used. The data set included daily data on food consumption for consecutive 15 days for 12,240 households. To estimate the parameters both Seemingly Unrelated Regression Equation (SURE) and Ordinary Least Square (OLS) has been used in the paper.

It has been found that the coefficient of carbohydrate to female head of the household is negative and significant. This means that if the household head is female then calorie intake from carbohydrate reduces. The coefficient of vitamin to female head of household is positive but it is not significant. It means that there is no difference in the intake of vitamin at the household level based on female head of the household. The coefficient of protein to female head of household is positive but not significant. It implies that there is no difference in protein intake at the household level in case of female headed households. The coefficient of fat to female head of household is positive and significant. It means that if the household head is female then fat intake will increase and if the household head is male fat intake will decrease. If other things remaining same female headed households take more fat than the male headed households.

People intake more carbohydrate than the desired level in Bangladesh. This is the outcome of the past food policies of Bangladesh of feeding the people with cereal and circumventing hunger. Giving more prominence on cereal help to achieve food self sufficiency but produce nutritionally vulnerable people and less productive future generation. Being a resource restraint country Bangladesh is not in a position to give concession to its productivity and growth. Therefore, the country now in its policies provides more importance to nutrition. Under this situation in this paper it is found that the relationship between female headed households and carbohydrate intake is negative and significant. It means from policies points of view these households will perform better.

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