

Pragmatic Household Returns, Remittance and Food Security Nexus: Consequence over the Populace of Bangladesh

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ABSTRACT

Attaining food security remains as a major concern 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 [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 food. Bangladesh has been successfully able to attain food security for its people emphasizing only on increasing food grain availability. In the last three decades, even as its population has more than doubled, food grain availability has kept pace with population growth. Heavy dependence on food grain makes the people remain nutritionally in poor condition. This situation exemplify that there is disconnect between food policy of feeding the people with food grain and nutrition. Therefore to achieve food security in actual sense emphasis should be given on nutrition. Household monthly income and remittance are the two most important determinant of attaining food security through their impact on accessibility dimension. Household monthly income is gradually increasing in Bangladesh and in remittance earning its position is seventh globally. Considering this view present study examine the impact of household monthly income and remittance 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 both household monthly income and remittance have positive and significant impact on protein and fat intake. Although household monthly income does not increase carbohydrate intake but remittance significantly raise carbohydrate intake. Household monthly income has positive and significant impact on vitamin intake but remittance has no such impact. However both household monthly income and remittance momentarily improve nutrition status of the population of Bangladesh.

KEY WORDS: Food security, Household monthly income, Remittance and nutrients.

INTRODUCTION

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 food. The Commission on Human Rights has repeatedly affirmed that hunger constitutes an outrage 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.

Bangladesh has been successfully able to drive on the road of its efforts to attain food security for its people emphasizing only on increasing food grain availability. In the last three decades, even as its population has more than doubled, food grain 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 food grains. 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.

According to the definition given in the World Food Summit 1996 “Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. It implies that having nutritious food is one of the key components of attaining food security. Majority of people of the world especially those in developing nations unable to obtain sufficient nutrition from food which is an essential human need. Achieving a balanced diet in terms of nutritional composition enables individuals to perform required daily activities, and populations to achieve appropriate health standards. An important concept in development economics is that malnutrition can be eradicated only with improvements in income that accompany long-term economic development.

Food consumption pattern is an important determinant of attaining food security. The components, the quantity and quality of food constitute the food consumption pattern. An imbalanced consumption pattern with inadequate quantity and poor quality make the attainment of food security difficult. A country's consumption pattern depends on biological, social, economic and psychological factors and these factors differ from country to country. Consumption pattern changes over time, being influenced by many factors and their complex interactions. Income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape consumption patterns. A consumption pattern with diversity in the food consumption basket and right quantity can satisfy the nutritional need of the people. Therefore income is an important factor in attaining food security.

Globalization increases the economic activities which led to a rapid international rise in demand for skilled and unskilled manpower during 1980s and 1990s. This change makes many people, especially those of the developing countries, to move to the outside destinations (Castles & Davidson, 2000). The increased external demand also created the opportunities for earning livelihood from abroad for a large

number of Bangladeshi semiskilled and unskilled workers. This relocation was, however, a greeting reprieve for Bangladesh as its development strategies since independence could not cope with and accommodate the growing demand for employment from a fast growing population. The consequence of the multidirectional relocation of people, both temporary and permanent, was the quick rise in remittances in the economy of Bangladesh.

The compositional types of migration from Bangladesh are of two types- permanent and temporary. The temporary migration is comprised of a great part of migration which is short term in nature and Asia centric. Massive investment in infrastructure in the Middle Eastern countries induced by petro dollars necessitated them to look for external workforce since mid 1970s. In addition to this fast economic development of the newly industrialized economies (NIEs) in the 1980s and 1990s coupled with the Japanese need created a high demand for less costly foreign labour in the East and South East Asian region. Both these economic events created scope for short-term employment opportunities for workers of many labour-surplus countries including Bangladesh. In 2020 a total of 7.40 million Bangladeshi migrants lived in abroad. However, the direction of permanent migration from Bangladesh remains mostly to the West and other developed countries in the world.

LITERATURE REVIEW

The debate regarding the relationship between nutrient intake and income has high importance in the development literature. Historically, the "conventional wisdom" of the World Bank and other development institutions was that deficient energy intake and hunger can be overcome through income growth (World Bank 1980, 1981). However, a series of articles emerged in the 1980s casting doubt on the role of income (Wolfe and Behrman 1983; Behrman and Wolfe 1984; Behrman and Deolalikar 1987). The role of income in nutrition continues to generate serious investigation, with divergent results appearing throughout the literature. While the positive relationship between nutrient intake and income is reinforced in some studies, other studies find either small or insignificant income elasticities. Moreover, some studies argue that the relationship is linear (Bhargava 1991), while other studies uncover important nonlinearities in the income-calorie relationship (Gibson and Rozelle 2005; Skoufias 2003). Finding a nonlinear relationship implies the impact of income on calorie intake is affected by the actual level of calorie intake. For example, high calorie consumers may not be as greatly affected by a marginal increase in income as low calorie consumers and as such will have a smaller elasticity.

Faridi and Wadood (2010) in case of Bangladesh found that regular wage earners are the most affected in food insecurity since their income is fixed and thus with higher food prices, their real income goes down. On the other hand, self-employed are able to vary their work or effort level and thus can compensate at least partly for the high level of food prices. Households where the household head is daily wage earner in both agricultural and non-agricultural sector are the worse in terms of food security. Salary wage earners are just slightly better than the daily wage earners. On the other hand, self-employed, both in agricultural and non-agricultural sector are faring well compared to any other categories.

Akçay and Karasoy (2017) in case of Algeria found that GDP per capita affects calorie consumption positively and significantly and remittances positively and significantly influence calorie consumption in the long run. Thow A. M. *et al* (2016) found that remittances can increase access to (purchased) food and may have a consumption smoothing effect, reducing households' vulnerability and leading to

improved food security and reductions in underweight. However, remittances appear to have little effect on markers of chronic undernourishment. Their study also suggest that the extra income from remittances may compound trends toward purchasing less healthy (nontraditional) foods that are associated with the nutrition transition. Isoto and Kraybill (2014) estimated the differences in consumption patterns for macronutrients and micronutrients between remittance recipients and non-recipients using data from Kilimanjaro, Tanzania. Major finding of their research was that remittances increased investment in intake of nutrients such as proteins, vitamin A, vitamin C and calcium that are nutrients vitally important for physical development of children and for improving the health of adults.

According to Regmi and Paudel (2016) remittances play an important role in improving the food security of households. Moniruzzaman (2020) also estimated the relationship between household food security and remittance income. He found that remittances influence food security conditions significantly and therefore represent a critical component of household food security. In general, remittances are positively correlated with household food-related consumption expenditures. The results also indicate that the presence of remittances reduces food-related uncertainties and provides a coping strategy for the household to counterbalance food-related shocks and improves the quality of diet in remittance-receiving households. Overall, it seems that immigration of a household member and consequent remittance flow increase the probability of a household being food secure.

In Nepal, Maharjan et al. (2017) found that remittances are used chiefly to supplement agricultural income to meet basic needs. According to Choithani (2017), remittances are also used to invest in the agricultural sector, which has a positive impact on the food security of households in Bihar, India.

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

$$\text{Maximize } U(\alpha_1, \alpha_2, \alpha_3 | \theta) \text{ subject to } M = P_1X^*_1 + P_2X^*_2 \text{ and so} \quad (3-1)$$

$$\alpha_i = f(X^*_1, X^*_2, \theta) \quad \forall i = 1, 2, 3 \text{ is the attribute production function.} \quad (3-2)$$

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 α_i 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,

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

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

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

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.

RESULTS AND DISCUSSION

A potential key determinant of nutritional status is household monthly income. Therefore, studies on the relationship between household monthly income and nutrient intake receive considerable attention. The average monthly household income (HIES 2010) in 2010 is estimated at Tk. 11,479 at the national level, Tk. 9,648 in rural area and Tk. 16,475 in urban area. Therefore on an average urban people earn more than the rural people. The average monthly household income in 2016 is estimated at Tk. 15,988 at the national level as per HIES 2016-17. Increase in monthly household income is 39.28% during the period.

Every year a considerable number of people migrated from their home to other places in Bangladesh and these migrations are of two type's migration within the country and migration outside the country or abroad. According to Household Income Expenditure Survey 2016-17 migrations per household is 11.2%. Table 1 gives the information about the number of migration from Bangladesh

Table 1: Percentage Distribution of Migrated Household by Residence

Sl No	Residence	Total	Within Country	Abroad
1.	National	12.28	3.97	8.60
2.	Rural	13.72	4.84	9.25
3.	Urban	8.33	1.62	6.85

Source Household Income Expenditure Survey 2010

Note: Within country and abroad migration added together does not equal to total because one household might have reported both categories.

According to the table 1 above migration to abroad from rural area is more than the urban area. In Bangladesh 8.60% people migrated from the country in year 2010. Both male and female persons are migrated from the country. Table 2 depicts the percentage distribution of migrated persons in terms of sex.

Table2: Percentage Distribution of Migrated Person by Sex and Residence

Sl No	Residence	Both Sexes	Male	Female
1.	National	100.00	97.17	2.83
2.	Rural	82.49	97.08	2.92
3.	Urban	17.59	97.60	2.40

Source Household Income Expenditure Survey 2010

Percentage of male migrated person is much higher than the percentage of female migrated person according to Table 2. Residence wise percentage male and female difference is nominal.

From the above discussion it is evident that percentage of people involves in migration is much high in Bangladesh. This implies that the remittance sent by them is also handsome amount which have socio-economic impact to the country. Remittance income which is a sum of money sent by someone working abroad to his or her family back home and it is rising rapidly in most low- and middle-income countries. Bangladesh is the seventh remittance receiver country of the world in 2022 (received 21 billion USD in 2022). In Bangladesh it is the only income source or additional income source at the household level. In most cases, first-round effects of remittances on economic development are felt at the households of the migrants (Taylor & Wyatt, 1996). When we find remittances move as person-to person flows, targeted to the needs of the recipients most of the time (Ratha & Mohapatra, 2007). In reality, remittances bring additional money to the recipient households to spend on higher consumption, better access to education and health services, improved housing and living conditions, and employment of resources in productive activities (Thao, 2009).

Remittances significantly boost income, consumption and saving at the household level. In all divisions (administrative area) of Bangladesh income, consumption and saving per household of remittance receivers far exceed that of households who do not receive remittances. For the remittance receiving households in 2010, income per month is on average 82 percent higher, consumption per month is 37.7 percent higher and saving per month is 107 percent higher relative to households who do not receive

remittances. Poverty headcount rates of remittance receiving households are 61 percent lower than the poverty headcount rate of households who do not receive remittances. Only 13.1 percent of the remittances receiving households were below the poverty line in 2010, compared with 33.6 percent for non-receiving households and 31.5 percent national average poverty incidence.

Despite nutrition being a key policy priority for health and development, studies on the effect of remittance income on diets and nutrition are not enough. Remittances primarily affect nutrition through their effect on total household income and expenditure which includes expenditure on food. Since remittance income increase the capacity to spend more by the recipient household it is expected that their expenditure on food will also increase. If this increased expenditure is carried out on buying of nutritious foods then it can be assumed that the nutrition level of the household will be increased. The nutrients that a human body receives from foods are of two types; macronutrients and micronutrients. The macronutrients are carbohydrate, protein and fat. The micronutrients are different vitamins and minerals. In the present study the impact of household monthly income and remittance income on carbohydrate, protein, vitamins and fat intakes are estimated.

Table 3: Regression Results

Dependent Variable >>>>	Seemingly Unrelated Regression Results			
Explanatory Variable	Carbohydrate (Kcal)	Vitamin (Kcal)	Protein (Kcal)	Fat (Kcal)
Monthly Household Income	-0.000466***	4.46e-05*	0.000634***	0.000280***
	(-2.739)	(1.735)	(15.899)	(6.375)
Remittance Income dummy (1 if present, 0 otherwise)	30.54***	-1.754	23.80***	24.87***
	(2.630)	(-1.007)	(8.642)	(8.359)
	Ordinary Least Square Regression Results			
Monthly Household Income	-0.000950***	6.35e-05**	0.000702***	0.000157***
	(-5.572)	(2.471)	(17.575)	(3.562)
Remittance Income dummy (1 if present, 0 otherwise)	21.25*	-1.384	23.29***	22.78***
	(1.828)	(-0.794)	(8.448)	(7.648)

Analysis of the Regression Results:***Impact of Monthly Household Income on Carbohydrate Intake***

The coefficient of monthly household income is negative and significant. This indicates that as the monthly income increases carbohydrate intake reduces. In other words, people do not prefer carbohydrate as a source of their calorie requirement when their income rises.

Impact of Inflow of Remittance Income on Carbohydrate Intake

Since remittance is a part of income, the model used a remittance dummy to identify households with remittance income only. The coefficient of remittance income dummy is found to be positive and is significant. It implies that households with inflow of remittance income take more carbohydrate compared to the households which do not have such inflows.

Impact of Monthly Household Income on Vitamin Intake

The coefficient of monthly household income is positive and significant. This indicates that as the monthly household income increases vitamin intake also increases. It shows the income effect on vitamin intake at the household level.

Impact of Inflow of Remittance Income on Vitamin Intake

The coefficient of remittance income dummy is negative but not significant. It implies that there is no difference in vitamin intake at the household level between households with inflow of remittance income and with no inflow of remittance income.

Impact of Monthly Household Income on Protein Intake

The coefficient of monthly household income is positive and significant. This indicates that as the monthly household income increases protein intake also increases. People prefer protein as a source of their calorie requirement when their income rises. Higher income significantly encouraged people to have more of this high value and important nutrient.

Impact of Inflow of Remittance Income on Protein Intake

The coefficient of remittance income dummy is positive and significant. It implies that households with inflow of remittance income intake more protein compared to the households which do not have such inflows. It implies that an additional income flow improve the nutrient intake of the household.

Impact of Monthly Household Income on Fat Intake

The coefficient of monthly household income is positive and significant. This indicates that as the monthly household income increases fat intake also increases. People prefer fat as a source of their calorie requirement when their income rises. Higher income significantly motivated people to have more of this high value nutrient.

Impact of Inflow of Remittance Income on Fat Intake

The coefficient of remittance income dummy is positive and significant. It implies that households with inflow of remittance income take more fat compared to the households which do not have such inflows. It implies that an additional income increase the intake of this high value nutrient.

CONCLUSION

'Food', the basic need for human existence instigated economic activities and sowed the seeds of civilization. Achieving food security remains as a major concern 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 nutrition to its people. Bangladesh has been successfully able to attain food security for its people emphasizing only on increasing food grain availability. In the last three decades, even as its population has more than doubled, food grain availability has kept pace with population growth. Heavy dependence on food grain makes the people remain nutritionally in poor 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 (BDHS, 2011). On the other hand percentage of women suffering from thinness is 30% i.e. women have BMI less than 18.5 (BDHS, 2011). This situation exemplify that there is disconnect between food policy of feeding the people with food grain and nutrition. Therefore to achieve food security in actual sense emphasis should be given on nutrition.

Household monthly income and remittance are the two most important determinant of attaining food security through their impact on accessibility dimension. Household monthly income is gradually increasing in Bangladesh and the country will be graduating to developing country category by 2026. In remittance earning its position is seventh globally. Percentage expenditure on food is 54.81 which is very high and it implies that household monthly income including remittance could play a vital role in improving nutrition level of the population. Considering this view present study examine the impact of household monthly income and remittance 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 monthly household income is negative and significant which indicates that people do not prefer carbohydrate as a source of their calorie requirement when their monthly household income rises. The coefficient of protein to monthly household income is positive and significant. This indicates that as the monthly income increases protein intake also increases. People prefer protein as a source of their calorie requirement when their income rises. The coefficient of fat to monthly household income is positive and significant. This indicates that as the monthly income increases fat intake also increases. Higher income significantly motivated people to have more of this high value nutrient. The coefficient of vitamin to monthly household income is positive and significant. This indicates that as the monthly income increases vitamin intake also increases.

The coefficient of carbohydrate to remittance income dummy is found to be positive and is significant. It implies that households with inflow of remittance income take more carbohydrate compared to the households which do not have such inflows. The coefficient of protein to remittance income dummy is positive and significant. It implies that an additional income i.e. remittance flow improve the nutrient intake of the household. The coefficient of fat to remittance income dummy is positive and significant. It implies that an additional income increase the intake of this high value nutrient. The coefficient of

vitamin to remittance income dummy is negative but not significant. It implies that there is no difference in vitamin intake at the household level between households with inflow of remittance income and with no inflow of remittance income.

Both household monthly income and remittance have positive and significant impact on protein and fat intake. Household monthly income has positive and significant impact on vitamin intake but remittance has no such impact. Although household monthly income does not increase carbohydrate intake but remittance significantly raise carbohydrate intake. However, both household monthly income and remittance momentarily improve nutrition status of the population of Bangladesh. Since under nutrition problem existent among the population and being a resource constraint country, Bangladesh is not in a position to bear the burden of productivity loss and the reduced potentiality of its future generation. Therefore, to attain food security the policy makers should give emphasis on the issues so that household monthly income and remittance flow increase.

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