

Transformation in Utilization Pattern of Farmland in Fringe of Mymensingh Town

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Abstract:

The main objective of the study was to find out the annual rate of transformation in utilization pattern of farmland to non-farm use. Besides, attempt was also made to explore and describe the reasons for transformation of farmland to non-farm use and find out the loss of production due to transformation of crop land to non-farm use. The study was conducted with 60 selected household owners of Mymensingh Sadar upazila under Mymensingh district. A pre-tested interview schedule was used to collect data from the household owners during October, 2011. During the ten-year period of 2001 to 2010 annual transformation of agricultural land was 1.97 percent. The main non-agricultural uses of converted land were identified as housing, brick fields making, business establishments and road construction occupying 46.95, 32.23, 12.44 and 11.41 percent of the converted land, respectively. The major reasons for land transformation were settlements, brick fields, gas station, government land acquisition, improper land cultivation and poorly constructed road networks. In general, 61.67 percent and 38.33 percent respondents responded on extent of reasons as high and medium for land transformation. On the basis of current estimation of rate of transformation of crop land, the annual loss of crop production was Taka 262.98 thousands.

Key words: Transformation, utilization, farmland, fringe, reasons

Introduction

Bangladesh is a developing country inhabiting about 143.2 million of people in its 147,570 sq. km. area (BBS 2011) and predominately an agricultural one. Agriculture is the main occupation of the Bangladeshi people. As agriculture is the dominant sector of the economy, land enjoys the highest importance as a resource. Another important aspect of land is that the rapid growth of population in a somewhat stagnant economy puts tremendous pressure on land, thereby adding scarcity value to a natural resource which is already in great demand. Bangladesh is an overpopulated country and its population growth rate is unacceptably high is 1.34 percent (BBS 2011). On the other hand, the area of cultivable land available for crop production is decreasing gradually because of construction works, housing, and various kinds of infra-structural development activities which are making the crises serious. We are not aware of the extent of transformation of farm land to non-agricultural uses in Bangladesh and consequent production losses in agriculture. Transfer of farm land to non-agriculture is also needed for expansion of housing facilities in both rural and urban localities. Such transfer is also evidenced in building infrastructures such as roads, markets, educational institutions, electricity and industrial establishments etc. (Mohammad 2009).

Agriculture is one of the main sectors which contribute a great amount to the national economy of our country. This sector directly contributes to around 20.94 percent of the gross domestic product. Though Bangladesh has got much fertile land but due to paucity of capital and lack of knowledge of new inputs and techniques its yield per unit area is one of the lowest in the world. Bangladesh is currently marginally deficient in food grains (BBS 2010).

Graff (1993) reported that developing countries generally have a high overall population density and a relatively high percentage of their people must make a living in agriculture as industrial and service sectors are still underdeveloped. He also showed that less than 0.8 ha arable land is available per economically active person in developing countries compared to more than 12 ha in developed countries.

Giri and Shrestha (1996) pointed out that the pressure of population on the land and its resources is a major factor affecting sustainable development in Bangladesh. Due to unscientific or mismanagement, changes of land use are taking place at an unprecedented rate.

Land is a very important and scarce resource of Bangladesh. Therefore, it should be managed very carefully to ensure the best possible use of this limited resources for the benefit of the maximum number of people and their development. Most of the land is used for agriculture, forestry, fisheries, settlement and urban developments. Major land use conflicts arise from uncoordinated action amongst the ministries and agencies concerned with land management. Yet now, very little attention has been paid to formulating a national land use policy to conserve and make the best possible use of this highly scarce natural resource by the government of Bangladesh.

So the study was conducted by focusing the following objectives:

- To find out the annual rate of transformation in utilization pattern of farmland to non-farm use.
- To explore and describe the reasons for transformation of farmland to non-farm use and also to find out the loss of production due to transformation of crop land to non-farm use.

Methodology

The study was based primarily on a field survey of four villages spread in the fringe of Mymensingh town of Mymensingh district. The villages Sambhuganj, Digharkanda, Barera and Khagdahar under the Mymensingh sadar upazila were selected purposively. The selection of villages for field survey at the outskirts of the towns was quite complex. As it was firstly had to capture the area potential for urban expansion and industrialization that existed ten years ago keeping in mind the level of land transformation that took place during the study period of early 2001 and end 2010. To understand the recent trend in the changes in land use, the selected villages had the normal access to the towns and the village area under agriculture indicating that there was still scope for farmland transformation to non-farm use. It also suggests that ten years back there was no limitation to land transformation as far as land availability was concerned. Furthermore, the villages were not under the low-lying topography and abnormal flooded condition that might restrict the land transformation. The rate of transformation of farmland to non-farm was so intense in these localities. In the selected villages most prominent area under transformation of land were selected purposively as cluster. From the selected cluster area total of 164 household heads were enlisted whose minimum land had gone under transformation. Sambhuganj, Digharkanda, Barera and Khagdahar had 38, 42, 39 and 45 of such households, respectively. Total of 60 households, 15 in each cluster were selected randomly from the list of resident household owners, prepared earlier by the Sub-Assistant Agriculture Officers (SAAOs) of the Department of Agricultural Extension (DAE). Total amount of land used by the farmland owners was measured at ten years back and present use by adding the land holdings under the aspects like homestead, cropland, orchard and bamboo bushes, non-crop agricultural land, non-

agricultural establishments and others. Then percentage of land converted in last ten years was calculated dividing the total land converted in ten years by total land owned in ten years back. Annual rate of transformation of farmland was also estimated dividing the percent of converted land during ten years by total years. The following formula is as follows:

$$\text{Percent of land transformation} = \frac{\text{Total land transformed up to 2010 (ha)}}{\text{Total land owned in 2001 (ha)}} \times 100$$

Measurement of reasons for transformation of farmland to non-farm use

Common and important eight statements were used to find out the major reasons for transformation of farmland to non-farm use. The reasons were identified through FGD (Focus Group Discussion) with eight farmland owners of each selected villages who had been facing the situation of transformation of their farmland to non-farm use. Here, farmland owners from similar backgrounds or experiences were brought together to discuss the topic. The main purpose of conducting FGD was to explore the range of views of transformation of farmland to non-farm. Four FGDs were conducted in four study villages.

Measurement of annual production loss due to transformation of crop land

To find out the loss of crop production due to transformation of crop land, present total cropped area was calculated. Total cropped area was calculated through the following formula:

$$\text{Total cropped area} = \text{Single cropped area} + (\text{Double cropped area} \times 2) + (\text{Triple cropped area} \times 3)$$

Production of all the respective crops like rice (*Boro, Aman*), jute, vegetables, bamboo bushes and nursery in Taka was

calculated at the present market price of that locality. The price of the products at present market price of each village was fixed through Focus Group Discussion. Then the production loss of converted land (crop, bamboo bushes and nursery) was estimated from the total production of the crop land used by the household owners in the present situation. Annual production loss was also calculated through dividing the production of the converted land by total years.

Findings and Discussion

Annual Rate of Transformation of Farmland to Non-farm Use

The current study estimated that during the ten years period from 2001 to 2010, 3.94 hectares of agricultural land was transformed to non-agriculture for the selected respondents. Table indicates that from the homestead, crop land, nursery and bamboo bushes, non-crop agricultural land and non-agricultural establishments annual rate of land transformation was 0.880 percent, 2.286 percent, 1.630 percent, 1.560 percent and 0.490 percent, respectively. Total percent of transformation of farmland by the respondents during the study period was 19.65 and annual rate of transformation of farmland was 1.97 percent (Table 1).

Land use	Total land owned in 2001 (ha)	Total land transformed up to 2010 (ha)	Percent of total land transformed in 10 years	Annual rate of land transformation (%)
Homestead	1.25	0.11	8.80	0.880
Crop land	13.65	3.12	22.86	2.286
Nursery and bamboo bush	2.27	0.37	16.30	1.630
Non-crop agricultural land	1.86	0.29	15.60	1.560
Non - agricultural establishments	1.02	0.05	4.90	0.490

Total	20.05	3.94	19.65	1.97
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Table 1 Area of land transformed during the period of 10 years (2001 to 2010) (n=60)

It is observed that the annual rate of transformation of farmland (1.97 percent) which is so much alarming whereas, the national annual rate of transformation of farmland is near about one percent (Quasem 2011). The transformation rate is so high due to expansion of houses, brick fields, shops and business enterprises, education and health organizations, road networks and so on. Due to expansion of the business the household owners become self- sufficient economically. This is possible through the earnings which is much greater than the cultivation of crops. That's why the agricultural lands are transformed to non-agricultural uses rapidly.

Non-agricultural Uses of Converted Agricultural Land

Data indicate that 46.95 percent of the converted agricultural land was used in housing. The next two important uses were in the brick fields and shops or business enterprises covering 32.23 percent and 12.44 percent, respectively (Table 2).

Sl. no.	Current non-agricultural uses	Area of land (ha)	Percent (%)
1.	Houses	1.85	46.95
2.	Brick fields	1.27	32.23
3.	Shops/business enterprises	0.49	12.44
4.	Roads	0.17	4.31
5.	Mills/factories	0.06	1.52
6.	Education and health organizations	0.05	1.27
7.	Public offices and utilities	0.03	0.76
8.	Unutilized	0.02	0.52
Total		3.94	100.0

Table 2 Non-agricultural uses of converted agricultural land (n=60)

Construction of roads covering area of use was also substantial (4.31 percent). In villages near urban areas, next to housing, brick fields, construction of roads and business establishment's

other major uses were mills or factories, education and health organizations, public offices and utilities etc. Each of them covered 1.52 percent, 1.27 percent and 0.76 percent, respectively of the total converted land.

The expansion of non-agricultural uses of farmland is increasing day by day. This is a great threat to the environmental sustainability as well as for the human beings. Because brick fields, mills and factories produce the dirty particles and also the green-house gases make the environment polluted. On the other hand, in the area near the brick fields, mills and factories might have acid rains. The expansion of non-agricultural activities was mainly due to the rapid explosion of population and modernization.

Reasons for Transformation of Farmland

The observed score of extent of reasons for transformation of farmland ranged 13 to 22 against a possible range of 0 to 24. The average score was 15.13 and standard deviation 1.24. Among the respondents 61.67 percent responded on medium and 38.33 percent on high extent of the reasons for transformation of farmland (Table 3).

Score range		Respondents (n=60)			Mean	SD
Possible	Observed	Category	Number	Percentage		
0-24	13-22	Low (0-8)	00	00	15.13	1.24
		Medium (9-16)	37	61.67		
		High (>16)	23	38.33		

Table 3 Extent of reasons for transformation of farmland

Respondents having high responses on the extent of the reasons mean the reasons are highly responsible for land transformation. Consequently, medium responses on extent of the reasons mean the reasons are moderately responsible for land transformation. From the Table it is very much clear to us that, all the respondents of the study areas emphasized on the extent of reasons as medium to high. So, we can say that, the identified reasons were the crucial factors for the

transformation in utilization pattern of farmland to non-farm uses. Here the statement “settlements” got the highest score of 147 and hence considered as the most crucial reason for land transformation (Table 4).

Reasons	Total score	Mean	Rank order
Settlements	147	2.45	1
Brick fields	144	2.40	2
Gas station	136	2.27	3
Government land acquisition	130	2.17	4
Improper land cultivation	125	2.08	5
Poorly constructed road networks	111	1.85	6
Water-logging	100	1.67	7
Industrialization	32	0.53	8

Table 4 Status of reasons for transformation of farmland

Note: Possible score range for each reason: 0-180

Settlements are due to the rapid growth of population. For the housing of huge population, people establish their houses on the agricultural land in unplanned way without considering the further effects. As a result the agricultural land is transformed to non-agricultural activities rapidly day by day.

The other statements, “brick fields” and “gas station” (Photo 4.6) got the score 144 and 136, respectively and hence considered as the 2nd and 3rd ranked as the reasons for transformation of farmland. Because of higher profit people are expanding their business on these aspects other than agriculture and as a result the land is transformed to non-farm activities.

On the other hand, government land acquisition, improper land cultivation, poorly constructed road networks, water logging and industrialization having the score 130, 125, 111, 100 and 32, respectively considered as the 4th, 5th, 6th, 7th and 8th ranked as the reasons for land transformation.

Annual Production Loss Due to Transformation of Cropland

According to the present study, production of different crops and vegetables reduced due to the transformation of farm land to non-agriculture. From the crops (rice, jute and vegetables) annual production loss was Taka 244.33 thousand. On the other hand, from the bamboo bushes and nursery the loss was Taka 18.65 thousand annually (Table 5).

Name of the crops	Total cropped area (ha)		Total production in a year ('000' Taka)		Amount of converted land in 10 years (ha)	Total production in 10 years ('000' Taka)	Annual production loss ('000' Taka)
	Individual	Total	Individual	Total			
Boro	12.06	29.43	1217.03	2304.65	3.12	2443.30	244.33
Aman	12.06		851.99				
Jute	3.12		76.05				
Vegetables	2.19		159.58				
Bamboo bushes and nursery	1.90		95.79		0.37	186.54	18.65
Total	31.33		2400.44		3.49	2629.80	262.98

Table 5 Annual production loss due to transformation of cropland (n=60)

Note: Total converted land from crop and bamboo bushes and nursery is 3.12 and 0.37 hectare came from Table 4.6.

In general the main crops lost were rice (*Boro, Aman*), jute, vegetables, bamboo bushes and nursery and total annual loss of production was Taka 262.98 thousand which was not a negligible amount. From this figure it is clear that a substantial amount of crop production is lost day by day which may ultimately reduce the food security level of the households.

Suggestions to Control or Adjust the Transformation of Farmland

The observed range of score of extent of agreement on suggestions to check the transformation of farmland was 13 to

22 against a possible range of 0 to 30. The average score was 14.77 and standard deviation of 1.43. Among the respondents 46.67 percent responded on medium extent and 53.33 percent responded on high extent of agreement of suggestions to check the transformation of farmland (Table 6).

Range		Respondents			Mean	SD
Possible	Observed	Category	Number	Percentage		
0-30	13-22	Low (0-10)	-	-	14.77	1.43
		Medium (11-20)	28	46.67		
		High (>20)	32	53.33		

Table 6 Extent of agreement on suggestions to control or adjust the transformation of farmland

Respondents having high response on extent of suggestions mean the suggestions will be highly responsible to check the land from transformation. On the other hand, medium responses on extent of suggestions mean the suggestions will be moderately responsible to control land transformation. Here, the statement “increase of food production through adoption of improved technologies” got the highest score 155 and eventually it ranked 1st.

Suggestions	Total score	Mean	Rank order
Increase of food production through adoption of improved technologies	155	2.58	1
Prohibition of transferring good agricultural land to non-agricultural uses	149	2.48	2
Imposing of special tax on transformation of land	142	2.37	3
Fixation of area-wise ceiling for non-agricultural uses of land	132	2.20	4
Exemption of tax for commercial farms and agro-based industries	115	1.92	5
Planning of housing and settlement programmes	112	1.87	6
Making of agriculture profitable and attractive	107	1.78	7
Improvement of the quality of life through coordinated efforts from multidisciplinary planning	98	1.63	8
Creation of alternative employment opportunities other than agriculture	86	1.43	8
Introduction of land reform programmes to replace existing land reform legislations for the betterments of	70	1.17	10

the cultivators and improve land productivity			
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Table 7 Status of suggestions to check or adjust the transformation of farmland

Note: Possible score range for each suggestion: 0-180

On the other hand, the statement “prohibition of transferring good agricultural land to non-agricultural uses” and “imposing of special tax on transformation of land” got the score 149 and 142, respectively and considered as 2nd and 3rd ranked as the strong suggestions to check the transformation of agricultural land. If special tax is imposed on the transformation of land, the transformation of agricultural land may be reduced. The other major suggestions like “fixation of area-wise ceiling for non-agricultural uses of land”, “exemption of tax for commercial farms and agro-based industries” and “planning of housing and settlement programmes” got the score 132, 115 and 112, respectively and considered as the 4th, 5th and 6th ranked.

Conclusion

Agricultural land is transformed to non-agricultural activities rapidly and this high rate of transformation will not only hamper the agricultural production but will have adverse impact on food security status at least at national level. Because of higher profit, people are expanding their business and consequently land is transformed to non-farm activities. It is clear that a substantial amount of crop production is lost day by day which may ultimately reduce the food security level of the households. The policy makers need to decide future land use options and allocation among different land uses to fulfill food demand and other development needs. Planning should be followed in housing and settlement programmes. The traditional practice of homestead is horizontal extension using more land and hence leaving less land for agriculture. The initiation of vertical extension of house building could save lands and free up more lands for agriculture. As agricultural

land is still not used to full potential for production, food production must be increased through adoption of improved technologies. Finally, the government of Bangladesh may take a proper initiative to formulate a national land use policy. Government should also consider the interest of the majority of the population and not only a few elites who virtually own and control most of the land resources.

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