

Development of Nutrition Through Homestead Fruit Cultivation in Bangladesh

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Introduction

Malnutrition is widespread in Bangladesh. The average food intake is deficient in calorie, calcium, vitamin A, riboflavin and vitamin C. Approximately 76% of rural households are deficient in calorie intake, 53% are deficient in protein intake, 87-96% are deficient in vitamin A, calcium, riboflavin and vitamin C intake, 58% are deficient in niacin intake and 8% and 18% are deficient in iron and thiamine intake. Condition of children are generally alarming. About 54% of the children aged 0-11 years old have low height for age (stunted), 5% have low weight for height (wasted) and 10% have both low height for age and low weight for height (simultaneously stunted and wasted). 75% of the children suffer from iron deficiency anaemia and over 4% of the children suffer from overt vitamin A deficiency disorders².

In general fruits are good sources of and several micronutrients particularly vitamin A and vitamin C³. Mango and jackfruit have high quantities of vitamin A per gram weight. Amla, guava, lemon, blackberry and papaya are rich sources of vitamin C, and mango, lichi, banana, jackfruit and pineapple are moderate to good sources of vitamin C. Blackberry is a moderate source of iron, Approximately

50 g of mango or 100 g of jackfruit can fulfil all the dietary requirements of vitamin A and vitamin C of an average adult daily.

In this paper an attempt is made to analyse the availability and consumption of fruit in the country. First the availability of fruits is discussed. Then the intake of fruits is presented. Finally, a case is argued for homestead fruit cultivation in the country.

Availability

Area and Production :

Fruit is grown in Bangladesh both as homestead crop and as field crop. But data on homestead fruit are generally unavailable. Banana, mango, jackfruit and pineapple are the major fruits both by area planted and quantity of production. Each of the crops occupy 5% or more of the total fruit area and produce 10% or more of the total fruit output by weight. By comparison, the other fruits occupy 2% or less area each and produce 2% or less output each by weight. The country cultivated 383531 acres of fruit and produced 134900 mt of fruit in 1987-88². Population during the period was 103.5 million and per capita availability of fruits, without accounting for losses and inedible portions, was 35.7 g per day. Assuming that per capita daily fruit requirement is

120 g, the available fruit fulfilled only 29,7% of the dietary requirements of fruits in the year.

Trend

Analysis of trends in area, production and availability of fruits from 1977-78 to 1987-88 indicates that during the period area under fruits increased steadily, Production fluctuated slightly more than the area. It increased from 1978-79 to 1982-83, fell in 1983-84, increased again in 1984-85 reaching an all time high in 1986-87 and fell again. The fluctuations in production were probably due to changes in weather and natural calamities such as storm and insect infestation. Analysis of trends show that on the average area increased by 4870 acres per year and production increased by 13470 mt per year during the period. Increase in production was however unable to keep pace with the growth in population, and per capita daily availability of fruits fell from 1977-78 to 1987-88. On the average it fell by about 5 g per year during the period.

Sources of Decline

Table 1 shows the changes in area, production and yield per acre of fruits from the mean 1977-78 to 1979-80 levels to the mean 1985-86 to 1987-88 levels. The means are used to avoid any fluctuations due to weather. It indicates that area under fruits increased by 12% production increased by 10% and yield decreased by 2% during the period.

Yield of mango and litchi decreased by 34%, consequently production of the crops fell substantially in spite of substantial increase in area. Yield of guava and jackfruit fell by 1-2%. Production of orange fell substantially due to large decline in area and yield. Production of citrus fruits other than orange and lemon fell mainly due to lower yield and production of pineapple fell due to lower area. Old age and high density of trees, indiscriminate cutting down of productive trees, absence of crop protection measures, inefficient transportation and marketing facilities, absence of storage and in general poor crop management practices the main causes for the lower yield and lower production.³

Consumption

Table 2 shows the per capita daily fruit intake. Fruit intake increased by 129% from 1981-82 to 1985-86, However the present fruit intake is only 24 g of edible quantity per capita daily which is equivalent to about 34 g of fruit as purchased assuming an average inedible portion of 30%. This compares with the per capita daily fruit availability of 36 g from field crops. The present fruit intake constitutes 2.7% of the average per capita daily meal of 874 g in the country. Fruit intake in rural areas is still lower. Urban fruit intake was 23-64% higher than the rural fruit intake in different years.

Homestead Fruit Cultivation

Per capita availability of fruits from field gardens is low and there is high prevalence of malnutrition in the country. Moreover, due to limited supply of cultivable land, field orchards face serious competition for land from other crops such as rice and wheat and from urbanisation. Since cultivation of foodgrains, such as rice and wheat, has more urgent needs, and demand for land for urbanisation is very urgent it is unlikely that field orchards will grow substantially in the near future. In this case initiatives to develop homestead fruit cultivation is the only alternative choice to meet the ever increasing needs of fruits in the country.

There is little information on homestead fruit cultivation in the country. Field observations suggest that at present utilization of homestead is not very efficient. Some homesteads have some nutritious fruits and vegetable but in other homesteads not so nutritious crops are grown. Almost all homesteads have some sunny areas where nothing is grown or where there is too much space between the plants. Cultivation of culturally acceptable nutritious fruits and vegetables in these areas would substantially increase the consumption and income of household members. Evidences suggest that real income in the form of food from own production contributes more to food consumption than an equivalent increase in cash income⁹.

Utilization of Homestead Area

Bangladesh Agricultural Research Institute provides some field level information which may be useful for understanding and evaluating homestead fruit cultivation. The information was collected in 1987 from a sample of 100 farm households in Rangpur district. Table 3 summarizes the data. It indicates that trees and bushes are common features in all homesteads. They occupy 40-52% of the homestead area. Generally mango, jackfruit, betelnut, guava, jujubi, coconut, bamboo, pithraj, kadam, paoa, kpok, neem, dateplam, lichi, berry, pameló, banana, pineapple, bottlegourd, ashgourd, sweetgourd country bean, brinjal, radish, plantain and potato are grown in the area. Besides, the homesteads have 7-30% area under home gardens and areas under ponds, ditches, cattlesheds and threshing floors parts of which can potentially be brought under fruit cultivation.

Input Use

Table 4 shows the input use pattern in different homestead farms. Manure, irrigation and labour were the major inputs used in the farms. 41-68% of the households used manure and 61-73% of the households used irrigation. On the average the households used 1.0-1.7 hours of labour per day in homestead farming. Use of female labour

predominated. Except in homesteads of landless households where males supplied more labour than females, female labour constituted 82-92% of the total labour supply. Manure, irrigation and labour were available from family sources. Use of purchased inputs was not common. Purchased inputs such as chemical fertilizers were used by 0-11% of the households in homesteads of different farm categories.

Output and Income

Table 5 shows the average number of trees and output from fruit trees in the homestead farms. On the average there were 6-35 fruit trees and 2-18 forest trees in homesteads of different farm sizes. The fruit trees produced an output of 762-2098 number of fruits annually which provided an annual cash income, after accounting for family consumption of 565-2860 taka per family. Apart from the fruits the households also produced vegetables in the homesteads which provided an annual cash income of 531-723 taka per family. Fruits and vegetables together, the families earned an annual cash income, after accounting for family consumption, of 1215-3500 taka per family from homestead farming. Given that the average farm income of rural families is 11400 taka per year⁴ the income from homestead farming is quite substantial.

Constraints

Several constraints of homestead farming have been identified which are summarized in Table 6. Lack of awareness of nutritional and income generation potential of homestead farming and lack of knowledge of homestead farming were the most important constraints. 82% of the respondents mentioned these constraints. 74% of the respondents mentioned lack of space as a constraint but this may be a reflection of their lack of knowledge of homestead farming. Lack of inputs, such as improved seeds, seedlings and irrigation were mentioned as constraints by 72% and 67% of the respondents, 71% of the respondents considered damage by livestock and poultry as a constraint, and lack of capital and low price were mentioned as constraints by 67% and 58% of the respondents.

The constraints are not however insurmountable. Given appropriate support the present agricultural extension facilities can be used to create the required awareness and impart the necessary training for homestead fruit farming. This together with a programme for supply of improved seeds and seedlings and supply of credit by the existing agricultural credit institutions can eliminate most of the constraints limiting the development of homestead fruit cultivation in the country.

Table 1. Changes in area, production and yield acre of fruits.

Crops	Mean	1977-78 to	1979-80	Mean	1985-86 to	1987-88	% Change		
	Area (ac)	Production (mt)	Yield (mt/ac)	Area (ac)	Production (mt)	Yield (mt/ac)	Area	Production	Yield
Banana	94927	591009	6.22	100993	711495	7.04	6.39	20.39	13.10
Mango	106900	221525	2.07	116135	158195	1.36	8.64	-28.59	-34.30
Pineapple	36245	139550	3.85	32763	135412	4.13	-9.69	-2.96	7.27
Jackfruit	47680	196244	4.12	59017	299292	4.05	23.78	21.94	-1.70
Papaya	6682	20008	2.99	8709	28853	3.31	30.33	44.21	10.70
Litchi	6967	11183	1.61	9183	9710	1.06	31.16	-13.17	-34.16
Bar	3608	4182	1.16	6428	7753	1.21	78.16	85.39	4.31
Guava	5475	8493	1.55	9735	14883	1.53	77.81	75.24	-1.29
Orange	1915	2379	1.24	1508	1408	0.93	-21.29	-40.82	-25.00
Pomelo	2547	3450	1.35	5027	7390	1.47	97.39	114.20	8.89
Lemon	3747	3380	0.90	6090	6622	1.09	62.62	95.92	21.11
Other Citrus	5985	8415	1.41	5960	8113	1.36	-0.42	-3.59	-3.55
Other Fruits	10455	21517	2.06	11350	23052	2.03	8.46	7.13	-1.46
TOTAL	333143	1231335	3.70	372853	1352178	3.63	11.92	9.81	-1.89

Source : BBS, Yearbook of Agricultural Statistics of Bangladesh, 1982

Table 2. Per capita daily fruit intake.

Year	Fruit intake (g)			Average per capita daily food intake in Bangladesh (gm)
	Bangladesh	Rural	Urban	
1981-82	10.4	9.9	13.6	751.8
1983-84	17.2	16.8	20.8	802.2
1985-86	23.8	22.0	36.0	873.9

Source : BBS, Report of the Bangladesh Household Expenditure Survey, 1984.

Table 3. Utilization of homestead area.

Usage	Landless house holds (0-0.5 ac)	Merginal farm house holds (0.51-1.00ac)	Small farm house holds (1.01-2.500ac)	Medium farm house holds 251-5.00ac)	Large farm house holds (Over 5.00ac)
Housing	0.025	0.050	0.075	0.100	0.125
Cattle shed	0.005	0.010	0.012	0.020	0.025
Ponds/ditches	-	-	-	0.005	0.050
Trees/bushes	0.050	0.125	0.170	0.100	0.350
Treshing floor	0.020	0.05	0.050	0.075	0.125
Home garden	0.025	0.050	0.025	0.125	0.100
Total	0.125	0.260	0.332	0.425	0.775

Source : BARI, BARI Annual Report 1987.

Table 4. Input use in homestead farming.

Household category	Manure (% of families)	Chemical fertilizer (% of families)	Irrigation (% of families)	Male (Hours per day)	Female (Hours per day)	Total labour (Hours per day)
Landless	41	3	71	0.91	0.41	1.10
Marginal farm	68	5	73	0.18	0.39	1.02
Small farm	67	9	67	0.16	0.35	1.51
Medium farm	56	11	61	0.15	0.34	1.40
Large farm	43	-	68	0.13	0.29	1.70

SOURCE : BARI, BARI ANNUAL REPORT 1987

Table 5. Average number of trees and annual output from fruit trees.

Household category	Fruit trees (No)	Forest trees (No)	Fruit yield (No)	Cash income from fruits (Tk)	Vegetable yield (kg)	Cash income from vegetables (Tk)	Total income (Tk)
Landless	6.6	4.1	762	694	205	521	1215
Marginal farm	13.4	12.3	781	565	178	698	1263
Small farm	14.4	2.0	2098	1621	218	683	2304
Medium farm	35.0	11.4	2056	1928	215	723	2651
Large farm	27.1	18.2	1985	2860	183	640	3500

Source : BARI. BARI Annual Report 1987

Table 6. Constraints of homestead farming.

Constraint	% of farmers
Lack of awareness and knowledge	82
Lack of space	74
Lack of improved seeds and seedlings	72
Damage by livestock and poultry	71
Lack of capital	67
Lack of irrigation	65
Low price	58

Source : CIRDP 1991, Mallick, RN 1989

Summary

Per capita daily fruit availability in Bangladesh is 36 g which fulfil less than one-third of the per capita daily fruit requirement. The average diet is highly deficient in several nutrients including calorie, calcium, vitamin A, riboflavin and vitamin C. Moreover, field orchards face serious competition for land from

major foodgrains and from urbanization. The low availability of fruit, high prevalence of malnutrition and competition of field orchards from other uses justify a programme for development of homestead fruit cultivation in the country. Fruits being rich particularly in vitamins, can address the vitamin A and vitamin C

malnutrition problems in the country. Homestead fruit cultivation is not unknown in Bangladesh. Evidences from one district suggest that on the average there are 6-35 fruit trees and 2-18 forest trees in homesteads of different farm sizes. The fruit trees produce 762-2056 number of fruits annually and provide an annual cash income, after accounting for family consumption, of 565-2860 taka per family. Apart from fruits the homesteads also produce some vegetables which provide an annual cash income, after accounting for family consumption, of 521-723 taka per family. Given that the average farm income of rural families is 1140 taka per year, the income from homestead farming is substantial.

Homestead farming has however several constraints, Lack of awareness of the utility of homestead farms, lack of knowledge of fruit cultivation, lack of improved seeds and seedlings and lack of credit are some of the chief constraints. The constraints are not however insurmountable. A mobilization using the existing agricultural extension facilities and agricultural credit supply institutions and a programme for supply of improved seeds and seedlings can eliminate most of the constraints and realize the potential benefits of improved homestead fruit cultivation in the country.

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