SOCIO-ECONOMIC IMPACT OF POMRA COMMUNITY FORESTRY PROJECT[1]

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ABSTRACT

A community Forestry Project was initiated in 1980 in the Protected Forest land at Pomra in the district of Chittagong. So far, 126 landless families have been rehabilitated in 24 groups in the project area by allotting 1.62 ha of denuded hills to each family. Most of the families took loans from the Bangladesh Krishi Bank for procuring inputs with the help of the Forest Department to amounts ranging from Tk 1,000 to Tk 4,000. The paper discusses the state of development of horticultural and forest plantations in these plots, and the improvement of the standard of living and socio-economic status of these families. The cropping pattern, input-output ratio, Land Expectation Value and employment intensity have been reported on the basis of a survey conducted on 24 families out of 126.

The operational mechanism of the project is also discussed. The major problems of the model have been outlined. The model, if properly developed may substantially contribute towards solving national problems like unemployment, poverty, food and forest products deficits by depicting a way of optimum utilization of the hitherto unproductive Unclossed State Forests, Protected Forests and hilly khas lands of the country.

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সারসংক্ষেপ

চট্টগ্রামের পোমরা ইউনিয়নে সংরক্ষিত বনাঞ্চলে ১৯৮০ সাল থেকে একটি কমিউনিটি ফরেস্ট্রি প্রকল্প চালু করা হয়েছে। এ পর্যন্ত ২৪টি গ্রুপে ১২৬টি ভূমিহীন পরিবার পুনর্বাসিত করা হয়েছে। প্রত্যেক পরিবারকে ১.৬২ হেক্টর গাছপালাবিহীন পাহাড়ী জমি বরাদ্দ করা হয়। বন বিভাগের সহায়তায় অধিকাংশ পরিবার বাংলাদেশ কৃষি ব্যাংক থেকে বাগান করার উপকরণ সম্ভার সংগ্রহ করার জন্য টাকা ১,০০০ থেকে টাকা ৪,০০০ পর্যন্ত ঋণ গ্রহণ করে। এ প্রবন্ধে বিভিন্ন প্লটে ফলবান ও বনজবৃক্ষের বাগানের উন্নয়ন, ভূমিহীন পরিবারসমূহের আর্থ-সামাজিক অবস্থা ও তাদের জীবনযাত্রার উন্নয়ন সম্পর্কে আলোচনা করা হয়েছে। ২৪টি স্যাম্পল পরিবার থেকে প্রাপ্ত উপাত্তসমূহের উপর ভিত্তি করে বাগান প্রতিষ্ঠিতকরণ পদ্ধতি, ব্যবহৃত উৎপাদন উপকরণ ও প্রাপ্ত উৎপাদনের অনুপাত, ভূমির উপযোগ সম্ভূত দাম এবং শ্রমনিয়োগ প্রাখর্য আলোচনা করা হয়েছে।

এ প্রবন্ধে প্রকল্পের সংগঠন প্রণালী, কার্যপদ্ধতি ও মৌলিক সমস্যাসমূহ ব্যাখ্যা করা হয়েছে। কর্মপদ্ধতি যথাযথ উন্নয়ন করা হলে আলোচ্য মডেল দেশের অশ্রেণীভুক্ত পাহাড়ী এলাকা, সংরক্ষিত বন এলাকা ও পাহাড়ী খাস ভূমিসমূহের সুষ্ঠু ব্যবহারের ব্যাপারে স্পষ্টভাবে দিক নির্দেশ করতে পারে। এ ভূমি ব্যবহার মডেল বাংলাদেশের কর্মসংস্থান সমস্যা, দারিদ্র, খাদ্য সমস্যা ও কাষ্ঠ-সংকট সমস্যার সমাধানে গুরুত্বপূর্ণ ভূমিকা পালন করবে।

PROJECT GENESIS

Pomra Community Forestry project was started in the district of Chittagong in 1980 on an experimental basis to mainly observe and demonstrate how the rehabilitation of landless people in the encroached and denuded hills could accelerate the land productivity and generate social welfare. So far, 126 landless families from the adjacent villages have been rehabilitated in the project area. The selection was made by a committee formed for the purpose, The committee was consituted with the Upazila Nirbahi Officer, Rangunia (Chairman); Range Officer, Pomra Range (Member-Secretary); Manager, Bangladesh Krishi Bank, Pomra Branch; Chairman' Pomra Union; Chairman, Betagi Union; Upazila Revenue Officer; Upazila Krishi Officer; Upazila Shamabaya Karmakarta; Upazila Project Officer; Upazila Police Inspector; Chief of Upazila Village Defence Party; Chairman of Rangunia Upazila Kendria Shamabaya Shamity; Mr. Nurul Kuddus Master; President of Betagi Bhumihin Shamity and President of Pomra Bhumihin Shamity. Each family was allotted 1.62 ha of hilly and unproductive Protected Forest land.

The terms and conditions of allotment were as follows :

— The rehabilitees would follow the suggestions of the Forest Department

— They would construct their huts on the top of the hills and live there permanently

— They would not work outside for additional income

Previously, these people worked as daily labour and remained unemployed for about seven days on an average every month. When they could not manage to procure any work, they used to cut jungles for sale as fuelwood. The average total income was only about Tk 7,000.00 per annum per family.

Bangladesh is an economy with a chronic problem of food shortage and unemployment. The per capita consumption of fuelwood and timber is only about 0.07 and 0.01 m^3 respectively (Douglas 1981). The prices of forest products are rising sharply and the standard of living of the people is declining. There are about 0.9 million ha of Unclassed State Forests in the Country (Byron 1984). In addition to this, 32.6 thousand ha of hilly Khas lands are available in the districts of Chittagong and Sylhet (Anon. 1980). A major part of this land resources has remained unproductive and contribute very little to the national economy. Under such conditions, one of the most feasible strategies of national development might be to utilize the unproductive lands by utilizing the unemployed people for the production of essentials like food, timber and other forest products. The Pomra Model depicts a way of utilizing denuded hills simultaneously by rehabilitating the landless people. The Forest Research Institute, Chittagong undertook a project to evolve ways for development of the Pomra Model.

THE SYSTEM OF PROJECT MANAGEMENT

The rehabilitated families have been divided into 24 groups, each comprising of five to six families. The whole project area has also been divided into two Circles. In each Circles there is an elected President. Moreover, a General President (G. P.) for the whole project is elected for one year. The G. P. sorts out the overall project problems, helps the group members in taking loan from the bank, conducts weekly and special project meetings, submits reports required for the cancellation of allotment of undersirable families and selection of a family in lieu of and does all the activities entrusted on him by the Forest Department or Upazila Project Committee. The meeting of the Committee is organised twice a year for reviewing the progress of the project, recruiting fresh members, cancelling undesirable membership, discussing different problems including new problems coming up and taking policy decisions. Final cancellation and selection are made by the Committee on the basis of the report submitted. The project operates under the technical assistance of Forest Department. A Range Officer and some field staffs have been instructed to extend all possible cooperation in respect of plantation, garden management, receiving loan from the bank, conducting case in the court and other related matters. A group meeting is held every Sunday in the project Office with the attendance of Forest Department staff. It is compulsory for all the members to attend the meeting. In these meetings the following activities are made :

— Reporting of weekly sales of vegetables, fruits, and other products and recording them in the record book

— Discussion of all community problems and taking decisions for their solution

— Depositing of weekly instalments and repayment of bank loan. In addition, every group member pays Tk 1.00 as group saving.

It is observed that these meetings contribute much in creating group spirit. The crops, the cropping pattern, the system of management and the way of people's participation combined together may be considered as a technology in itself.

After rehabilitation the families started their works in their respective plots without any financial assistance from outside. The Bangladesh Krishi Bank, Pomra branch was approached to give them loan for meeting their financial requirements during the gestation period. The bank accepted the proposal and granted loan on the basis of Gramin Bank procedures. Different families received loan to amounts ranging from Tk 1,000 to 4,000. All group members are jointly responsible for the loan. If any member fails to repay the debt as per terms and conditions of the loan, other members of the group are not granted further loans.

THE CROPS AND CROPPING PATTERN

The following three types of crops in addition to forest species are grown in the project area

Short rotation Crop : Vegetables (*barbati*, beans, sweetpumpkin, lady's finger, *jinga*, pepper, brinjal, tomato, pumpkin, aram are major crops and *karala* water melon, *lal-shak*, potato, etc. are minor crops).

Medium Rotation Crop : Papaya, banana, lemon, guava, pineapple, etc.

Long Rotation Crop : Jack fruit, mango, coconut, betelnut, etc.

Lemon, jack fruit, guava, papaya are the major fruit species (about 70%). Forest species like jam, koroi, simul, seori, mahogany, *eucalyptus*, *acacia*, etc. have been planted. In addition, a good number of trees of different species have grown naturally.

The cropping pattern of some of the selected species is given in Table 1.

Table 1. Cropping pattern of selected species at Pomra Community Forestry project

Species	Plantation site	Spacing (m)
Lemon	slope and bottom	3.6 x 3.6
Jack fruit	-do-	9.1 x 9.1
Guava	-do-	3.6 x 3.6
Papaya	-do-	1.8 x 1.8
Coconut	bottom	3.6 apart in lines
Betelnut	-do-	1.8 apart in lines
Pineapple	slope	1.2 apart in lines
Forest species	top and slope	1.8 x 1.8 (mostly)

Table 2. Development of forest and horticultural plantation, stock of trees naturally grown and area under vegetable production (upto May 1986)

Sl. No. of sample families	No. of fruit trees including banana groves pine apple, etc.	No. of forest trees planted	No. of bamboo groves planted	No. of forest trees naturally grown	Area under vegetable production, (ha)
1	354	60	–	162	0.40
2	760	113	–	458	0.40
3	784	40	3	360	0.20
4	929	15	2	155	0.28
5	133	40	2	124	0.32
6	439	53	–	69	0.32
7	410	13	3	67	0.10
8	463	63	4	17	0.08
9	196	16	3	264	0.16
10	694	75	8	99	0.32
11	1,206	17	–	405	0.28
12	204	115	4	40	0.06
13	767	44	4	658	0.24
14	804	204	3	154	0.32
15	382	64	–	50	0.40
16	298	7	3	24	0.18
17	597	57	5	20	0.26
18	554	37	2	145	0.40
19	1,476	38	–	109	0.36
20	242	15	–	105	0.16
21	909	346	–	30	0.16
22	242	15	–	105	0.28
23	150	33	–	126	0.40
24	223	13	2	157	0.40
Mean	550.6	62	2	162.7	0.27

It is found that a considerable number of fruit and forest species have been planned without maintaining any ideal cropping pattern. Also no specific area for different types of crop have been maintained.

DEVELOPMENT OF PLANTATION AND VEGETABLE PLOTS

A preliminary socio-economic survey covering one family from each group shows that up to May, 1986 the average number of planted fruit trees (including banana groves), forest trees and bamboo groves were 550.6, 62 and 2 respectively. The average number of forest trees naturally grown was 162.7 and the average area under vegetable production was 0.27 ha. Family-wise description of tree distribution is given in Table 2.

Thus Multiplying the mean value in Table 2 by the total number of families,

the total number of fruit trees and plants, forest trees planted, bamboo groves and forest trees naturally grown are about 69,375, 7,812, 252 and 20,500 respectively. The total area under vegetable cultivation is approximately 34.02 ha. The condition of the growing stock is not bad.

INPUT-OUTPUT RATIO

The major inputs which are normally required for production are seeds and seedlings, fertilizer, insecticides, hand tools and physical labour. Table 3 shows the item-wise cost of input and the amount of labour contributed by different sample families of the project.

Table 3. Statement of annual input costs and labour contribution of sample families of Pomra Community Forestry Project during 1984-85

Sl. No. of sample family	Cost of seeds and seedlings (Tk)				Cost of fertilizer and insecticides (Tk)				Grand Total (Tk)	Labour hour contributed (hr/day)
	Forest spp	Fruit spp	Vegetable	Total	Forest spp	Fruit spp	Vegetable	Total		
1	50	250	800	1,100	50	100	750	900	2,000	12
2	100	100	450	650	50	100	400	550	1,200	16
3	50	190	350	500	50	150	400	600	1,100	12
4	100	300	400	800	50	150	800	1,000	1,800	8
5	100	300	100	500	40	110	250	400	900	10
6	50	200	300	550	50	200	550	750	1,300	14
7	45	55	60	160	40	60	250	350	510	13
8	65	100	355	520	15	20	80	115	635	20
9	50	150	670	870	30	75	150	255	1,125	8
10	25	175	400	600	50	150	500	700	1,300	12
11	50	300	400	750	40	300	760	1,100	1,850	12
12	100	350	300	750	20	200	450	670	1,420	8
13	30	300	150	480	30	250	300	580	1,060	20
14	100	500	600	1,200	300	400	500	1,100	2,300	18
15	30	200	1,500	1,730	50	255	900	1,200	2,930	15
16	50	250	300	650	50	250	300	600	1,250	12
17	100	200	750	1,050	50	200	600	850	1,900	12
18	30	300	2,000	2,330	100	400	1,500	2,000	4,330	14
19	100	500	1,500	2,100	100	200	900	1,200	3,300	14
20	50	200	250	500	25	250	300	575	1,075	6
21	200	300	500	1,000	150	250	500	900	1,900	10
22	25	125	500	650	40	160	700	900	1,550	10
23	20	100	300	420	25	100	400	555	945	15
24	40	250	200	490	30	150	400	580	1,070	8
Mean	65	234	549	848	56	186	525	767	1,615	12

It is found from Table 3 that average input cost per family was about Tk 1,615 during 1984–85.

The total income of the sample families comes from vegetables, fruits, sungrass, fuelwood, milk, eggs, etc. The Table 4 shows the statement of itemwise income of sample families during 1984-85.

It is found from Table 4 that the total average family income was Tk 9,024 during 1984-85. Maximum income came from vegetables followed by fruits. The above figures do not include family consumption. Income from livestock resources was very insignificant. The livestock resources did not properly develop. The position of livestock of sample families during 1984-85 is given in Table 5.

Table 4. Statement of itemwise income of sample families during 1984—85

Sl. No. of sample family	Income from				Total
	Vegetable (Tk)	Fruit (Tk)	Sungrass and fuel wood (Tk)	Misc. (milk, egg, etc.) (Tk)	(Tk)
1	4,000	5,100	600	–	9,760
2	5,500	5,250	5,000	–	15,750
3	1,500	500	2,000	310	4,310
4	4,000	5,000	1,500	–	10,500
5	4,000	800	3,000	–	7,800
6	5,000	750	2,000	100	7,850
7	1,000	2,900	2,500	–	6,400
8	3,000	1,500	1,000	–	6,500
9	2,000	1,500	1,500	1,200	6,200
10	4,500	4,950	500	–	9,950
11	4,500	–	4,000	2,200	10,700
12	1,000	850	4,000	–	5,850
13	3,000	950	1,200	–	5,150
14	8,000	10,100	400	–	22,100
15	1,000	3,500	3,000	–	16,500
16	2,500	1,975	2,000	–	6,475
17	6,000	7,550	2,500	–	16,050
18	10,000	4,100	600	–	14,700
19	5,000	6,500	2,000	–	13,500
20	3,000	850	3,000	–	6,850
21	2,000	1,000	–	2,500	5,500
22	1,500	600	1,000	–	3,100
23	3,000	200	1,000	–	4,200
24	600	250	900	–	1,950
Mean	3,942	2,786	2,033	263	9,024

Table 5. Position of livestock resources of sample families during 1984—85

Sl. No. of sample family	Cows (Nos)	Goats (Nos)	Hens (Nos)	Total (Nos)
1	2	–	5	7
2	2	–	4	6
3	1	–	–	1
4	–	–	–	–
5	5	2	–	7
6	1	–	5	6
7	1	2	–	3
8	2	–	8	10
9	2	–	6	8
10	4	3	5	12
11	4	–	10	14
12	–	–	5	5
13	2	4	–	6
14	–	–	3	3
15	2	–	–	2
16	3	–	–	3
17	2	1	–	3
18	2	4	6	12
19	4	3	10	17
20	2	–	3	5
21	–	–	–	–
22	2	–	5	7
23	4	–	8	12
24	2	–	2	4
Mean	2	0.8	3.5	

The average input-output position as shown in Table 3 and 4 is computed in Table 6.

Table 6. Average input-output situation under Pomra Community Forestry project during 1984-85

Input	
(i) Average annual cost of seedlings (veg. & fruit)	Tk 783
(ii) Average annual cost of fertilizer and insecticides (veg & fruit)	Tk 711
(iii) Average labour contribution (net of family consumption component of products)	Tk 3000
(iv) Average depreciation overheads	Tk 150
Total :	Tk 4,644

Output	
(i) Average income from vegetable	Tk 3,942
(ii) Average income from fruit	Tk 2,786
(iii) Average income from sungrass and fuel wood	Tk 2,033
(iv) Average income from livestock	Tk 263
Total :	Tk 9,024

In Table 6, cost of inputs in respect of forest species has not been included, because the corresponding income contribution associated with this input costs cannot be readily quantified. The income side does not also include family consumption of fruits and vegetables. In order to include family consumption of vegetables, fruits, sungrass, fuelwood and timber, etc. cost of labour contribution has been halved. Under this circumstances the output-input ratio stands at about two. In the future, with the growth of fruit trees and improvement of vegetable plots the income is likely to rise considerably. Again, this output-input ratio includes income from fruit trees for whch investment was made earlier. But at the same time the input cost made during 1984–85 for planting and developing new fruit trees has been taken into consideration although they are expected to give return in the future. Recently, the input cost for plantation development is higher than that was in the initial period of the project. Excluding labour cost the output-input ratio becomes 5.4. Major part of labour is contributed when there is no outside work and the shadow price of such labour will be much less. Considering these fact the output-input ratio may be more than three which is higher than many other activities like agriculture. This ratio is highly significant in a situation where barren hilly lands are being utilized profitably by the landless families in a labour-surplus economy.

ASSESSMENT OF LAND PRODUCTIVITY

The assessment of land productivity under the Pomra Community Forestry Model is rather difficult because there is no particular crop of a specific rotation. In a given unit area there are trees belonging to different species and of different ages. Moreover, a considerable part of the allotted land will be developed in later Periods. Data regarding volume increment of these heterogenous forestry species are not known. It is still more difficult to project their market prices. Under this situation calculation based on rotation is not possible. The calculation of land values will have to be calculated on the basis of long-run annual net income. At the present moment the annual average costs per hectare for inputs, labour and overheads are Tk 997, Tk 1,863 and Tk 33 respectively making a total of Tk 2,953. In the long-run, higher costs will be associated for developing more area of plantation in a given plot. When the plots will be planted, the costs will again come down. Considering this aspect, the long-run cost per hectare may be around Tk 3,500. The average revenue earning per hectare from vagetables and fruits will sharply increase and return from forest species will also be added. The experiences from Betagi justify this fact (Rahman 1987) The long-run annual revenue stream per hectare may be more than Tk 10,000 giving an annual net income of Tk 6,500.

At Betagi net income per hectare of a few plots has reached an amount of Tk 10,000 even though the return from timber species has not yet started to come. With an annual net income of Tk 6,500 per hectare, the land expectation value has been calculated using the following formula (Davis 1966)

$$L_e = \frac{a\,(1+i)^n - 1}{i\,(1+i)^n} = \frac{a}{i}$$

Where, L_e = Land expectation value

i = Rate of interest (15% in this calculation)

n = Number of years (infinite in this calculation)

a = Stream of annual net revenue

The L_e values for a comparable and adjacent barren protected forest plot (PF Plot) and a leased-over plot in the same area have also been calculated. The collected data indicate that for PF Plot long-run annual net revenue will not exceed Tk 600 per hectare (which will be enjoyed by encroachers) and for leased-over plot it may be around Tk 1,000 per hectare. The L_e values per hectare for the same type of land under three types of management has been shown in Table 7.

Table 7. Land expectation value for Pomra Community Forestry Project land, protected forest plot and leased-over plot

Land management type (Alternatives)	L_e per hectare at 15% interest (Tk)
1. Pomra Community Forestry	43,333
2. Leased-over plot	6,666
3. Protected forest plot	4,000

It is evident from Table 7 that with the rehabilitation of landless farmers and by considering a situation where a very small amount of capital inputes are employed, the L_e value rises tremendously compared to other alternative uses.

THE PROJECT FEASIBILITY

The Internal Rate of Return (IRR) generating from landless farmers investment has been calculated on the basis of cost and income data of only one year. The following formula has been used (Williams 1981):

$$\left(\sqrt[n]{\frac{R}{E}} - 1\right) \times 100 = IRR$$

Where, R = Income

E = Expenditure; and

n Number of years

During 1984–85, IRR was 90%. In the future it is likely to increase. If indefinite series of income and expenditure data were used the IRR figure would have been very high. The IRR figure of 90% is high compared to those of many agricultural projects.

MAJOR SOCIO-ECONOMIC IMPACTS OF THE PROJECT

The project has created employment opportunities for 126 landless families. Previously they were unemployed to the extent of about seven days a month in the average. Their average annual family income was only about Tk 7,000. At present they have been provided with full employment opportunity. Their income has increased and consequently their standard of living has improved as illustrated in Table 8.

Table 8 shows that in almost all the families total amount of expenditure during

Table 8. Previous status and present expenditure on basic needs of the families rehabilitated under Pomra Community Forestry Project

Sl. No. of sample family	No. of family member (1984–85)	Previous status			Present annual Exp. on basic needs ('000 Tk)						
		Land area (ha)	Un-employ-ment of the head of family (Day/month)	Total family income ('000 Tk.)	Food	Cloth-ing	Hous-ing	Medi-cal treat-ment	Edu-cation	Recrea-tion	Total
1	5	–	7	7.8	14.4	1.5	0.7	2.0	1.0	0.2	19.9
2	6	0.01	9	6.0	18.0	1.3	0.8	1.0	–	0.1	21.2
3	5	0.10	8	6.0	14.4	0.8	0.6	0.8	–	0.1	16.7
4	3	–	8	6.0	9.6	0.6	0.5	1.5	–	0.2	12.4
5	8	0.02	6	6.0	19.2	1.5	0.5	1.5	–	0.1	22.8
6	5	0.02	7	7.2	14.4	0.7	0.4	0.8	–	–	16.3
7	6	0.12	7	6.0	14.4	0.8	0.4	0.8	–	0.1	16.5
8	6	0.01	10	5.4	18.0	0.8	0.4	0.6	0.3	0.3	20.4
9	4	–	5	8.4	14.4	1.2	0.6	1.5	–	0.3	18.0
10	5	0.01	5	7.2	13.2	1.3	0.6	1.0	0.5	0.2	16.8
11	6	0.04	5	8.4	15.6	1.0	0.5	1.5	–	–	18.6
12	7	0.02	8	6.0	19.2	1.5	0.5	2.0	0.3	–	23.5
13	9	–	9	7.8	30.0	1.5	0.5	2.0	1.0	1.0	36.0
14	6	0.32	6	8.4	18.0	1.5	0.5	2.0	1.5	0.5	24.0
15	7	0.06	5	7.2	18.0	1.2	0.7	1.2	0.5	0.2	21.8
16	5	–	7	8.6	18.0	0.6	0.5	0.8	0.3	0.1	20.3
17	6	0.05	8	7.2	18.0	1.0	0.5	0.8	–	0.1	14.4
18	7	0.01	6	7.8	18.0	1.5	0.5	1.2	0.8	0.2	22.8
19	6	0.02	6	7.2	18.0	1.2	0.5	1.5	–	0.2	21.4
20	4	–	6	6.0	12.0	0.6	0.5	0.5	–	–	13.6
21	7	0.08	–	9.0	18.0	0.8	0.6	1.8	1.5	0.5	22.6
22	4	0.01	6	8.4	14.4	0.8	0.6	0.5	–	0.3	16.6
23	7	–	5	9.6	16.8	1.5	0.5	0.8	–	–	19.6
24	5	0.01	7	9.6	12.0	1.0	0.4	1.0	–	–	14.4
Mean	5.7	0.04	6.5	7.3	16.3	1.1	0.5	1.2	0.3	0.2	19.6

1984–85 has been two to more than three times higher than their previous expenditure. This indicates that their standard of living has improved. This socio-economic trend is in conformity with the national target of improving the standard of living of the people.

Previously each of these families possessed only 0.03 ha of homesteads on an average. With the allotment of land the housing problem has naturally been solved.

The Forest Department tried to raise plantations in many of these plots in the past. But the attempt proved failure because of large scale encroachment. Consequently, these hills turned into almost barren grazing fields or completely barren lands. There was practically no tree cover and cowboys could only collect some bundles of fuelwood from the scattered bushes. But at present the productivity of these lands has improved. It is found that L_e per hectare is more than Tk 43,000 ; whereas in case of leased over plot and vacant protected forest plot are only Tk 6,600 and Tk 4,000 respectively. It proves that rehabilitation under Pomra Community Forestry Model is about seven times better than leasing over the land to the people or managing the land under natural regeneration. Optimum utilization of resources including land is an important national strategy of development. The project shows a better pattern of land utilization which ensures far-reaching effect on socio-economic development.

The Pomra Community Forestry Project proves that the raising of horticultural gardens and producing vegetables along with establishment of forest plantation in the hill is economically feasible. The output-input ratio during 1984–85 was more than three and IRR (excluding linkages) during that year was 90%. These estimates were very conservative. Over years to come the IRR will be definitely higher. This indicates that investment on this type of project for growing fruits and vegetables along with trees will be better than investment in agriculture and other sectors. At the same time, forest plantations have also been developed and some species have grown naturally. The condition of growing stock of forest species is satisfactory. Thus the project has also fulfilled the objectives of Forest Department. It is hoped that in near future the entire area will be self sufficient in timber and fuelwood.

The Pomra Community Forestry Project has turned into a technology in itself. The system of management, the way of people's participation in economic activities, the growing of crops and the cropping pattern combined together may substantially contribute in future research and planning.

Another socio-economic impact of the project has been that the supply of sungrass and fuelwood in the local markets has considerably increased. Previously the local people had to bring sungrass from other places at a much higher price. But at present the price of sungrass has come down.

The landless farmers are now supplying guava, jackfruit, lemon and vegetables to the local markets and to other areas such as Chittagong city. The amount of supply of these products is not yet sizeable. In future it is likely to increase. The products are highly desirable in our social life. In fact, the Government is directing

a great part of total resources in encouraging the production of these commodities. In a country like Bangladesh where the deficit of food is acute this kind of project may be highly rewarding.

With the implementation of the programme, the socio economic condition of the area has improved and consequently social crimes have decreased to a great extent.

The project has so far developed without any direct financial assistance of the Government and it is one of the most important aspects which deserves special attention of planners and policy makers.

THE BASIC PROBLEMS

The income of the landless families from the plots have yet remained below subsistence level. As a result they cannot afford sufficient inputs which cause less production and less income. In order to meet the demand of bare necessities of their families they divert their labour elsewhere. This fact is illustrated in Table 9.

In Table 9, column 3 includes expenditure on basic needs and cost of inputs. It is seen that all the sample families had deficit income. The mean income was Tk 9,000 and mean expenditure was Tk 21,000 giving a mean deficit of Tk 12,000. To meet this short-fall they has to work outside. Thus, the model is found to be internally inconsistent, because according to the given terms and conditions they cannot work outside. Because of the deficit they could not invest enough money and consequently the income remained low and constant. If it were possible for them to devote more labour, their income would enhance.

Table 9. Family-wise gap of annual income from project plots and annual expenditure on basic needs during 1984-86

Sl. No. of sample family	Total annual income from project plots ('000 Tk)	Total annual expenditure ('000 Tk)	Annual deficit ('000 Tk)
1	2	3	4
1	9.7	21.8	12.1
2	15.8	22.4	6.6
3	4.3	17.8	13.5
4	10.5	14.2	3.7
5	7.8	23.7	15.9
6	7.9	17.6	9.7
7	6.4	17.0	10.6
8	5.5	21.0	15.5
9	6.2	19.1	12.9
10	10.0	18.1	8.1
11	10.7	20.5	9.8
12	5.9	24.9	19.0
13	5.2	37.1	31.9
14	22.1	26.3	4.2
15	16.5	24.7	8.2
16	6.5	21.6	15,1
17	16.1	16.3	0.2
18	14.7	27.1	12.4
19	13.5	24.7	11.2
20	6.9	14.7	7.8
21	5.5	24.5	19,0
22	3.1	18.2	15.1
23	4.2	20.5	16.3
24	2.0	15.5	13.5
Mean	9.0	21.0	12.0

Because of poor investment they could not develop their plots according to an ideal cropping pattern as intended by the Forest Department. Had an ideal pattern been followed the L_e value and IRR would be a few times higher and in the long-run the plots would approach optimum productivity level. For research and demonstration purposes information in respect of an ideal cropping pattern is essential.

The inconsistency of the model and lack of ideal cropping pattern will create problems of community instability. If such a project is initiated in the remote forest areas, community stability will be a major problem. Because in these areas the laudless people would not get opportunity to work outside to add to their income and consequently they will leave the place. This problem has arisen at Bandarban and some other forest areas where the Forest Department has rehabilitated jhumias or landless farmers. At Pomra also there are many families who work for a few hours in their plots during the day time and then go away. They do not live there permanently. Therefore, it is necessary to introduce such a feedback system which will compel them to stay in their plots even at night. The lack of a feedback system, such as establishment of cottage-level firms, has been a great problem of Pomra Community Forestry Project. Such a system would help to develop community stability.

Lack of a socio-economic infra-structure is also a great problem at Pomra. There are problems of educational institutions, roads, medical facilities, water and crop damage by wild animals, particularly porcupines. In addition, there is also lack of a suitable marketing system. At present one or more members from all the families need to come to market or roadside selling centre with their products for sale. The average distance is more than five miles. It is definitely a wastage of time and labour to go to such a distance.

CONCLUSION

Pomra Community Forestry Project offers a land use model by depicting a way of utilizing the encroached and denuded hills through rahabilitating 126 landless families in the Protected Forest area. The crops, the cropping pattern and the way of their participation combined together turn up to be a technology in itself.

It is found from a preliminary survey of 24 sample families that the socio-economic status of the landless families has improved considerably. Their present income is more than three times higher than their previous income. The land productivity has improved compared to other land management alternatives. The L_e value per hectare of project plots has risen to more than Tk 43,000 compared to Tk 6,600 and Tk 4,000 in case of lease over plots and vacant Protected Forest plot. The product of the project such as sungrass, fuelwood, fruits and vegetables are socially desirable and the activities are economically feasible. The output input ratio is more than three and IRR is 90%. The project has generated not only employment opportunities but also helped to develop better growing stock of forest species. At present average number of fruits trees and forest trees per hectare is 338 and 140 respectively. In spite of this success the project is confronted with the

problems of internal inconsistency, community instability, lack of ideal cropping pattern, insufficint socio-economic infrastructure and improper market mechanism. The better and earlier these problems are solved the greater would be the economic benefit of landless masses and the nation as a whole.

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