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IMPACT OF THE SMALL FARMERS DEVELOPMENT PROGRAM ON SMALL FARMERS IN NAWALPARASI DISTRICT

Jaysingh Sah

HMG-USAID-GTZ-WINROCK PROJECT
STRENGTHENING INSTITUTIONAL CAPACITY IN THE
FOOD AND AGRICULTURAL SECTOR IN NEPAL

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IMPACT OF THE SMALL FARMERS DEVELOPMENT PROGRAM ON SMALL FARMERS IN NAWALPARASI DISTRICT

Jaysingh Sah*

ABSTRACT

This study assesses the impact of the Small Farmers Development Program (SFDP) on the income, consumption, assets, and employment of small farmers. It further examines the existence of differential response to the SFDP and different benefits derived by different (hill and Tarai) beneficiaries. The analysis is based on the primary data collected in 1984 from 120 randomly selected beneficiaries and 30 non-beneficiaries from the project area of the SFDP in Ramnagar, Nawalparasi District.

Hill beneficiaries significantly benefitted from the program. The response of hill villagers to the SFDP was higher than that of Tarai villagers.

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INTRODUCTION

Nepal had a population of 15 million in 1981 with 56 percent in the hills and the rest in the Tarai (plains) area (NCP, 1983). Geographically, land distribution of hills/mountains and Tarai is 82 percent and 17 percent respectively. There are many differences between the social and cultural characteristics of these two categories of people (Gaige, 1975).

Agriculture is the mainstay of the Nepalese economy. About 18 million Nepalese households (?? percent of the population) fall into the small farmer category mainly because of the skewed distribution of land holdings which has resulted in the non-viability of the majority of the farms. To control the increasing disparity between the income of the large and small farmers, HMG/N felt the need of a suitable program which could address the problem of making small farmers more self-reliant and improving their socio-economic status. It gave rise to Small Farmers Development Program in 1975. At present, there are 145 SFDPs running under ADB/N and covering about 1.5 percent of all small farm households.

The "group approach" is the basis for loan procedures and "group liability" is the main collateral considered in the SFDP philosophy. Homegeneity is observed in the formation of groups. However, studies indicate that small farmers should not be considered as a homogeneous group even within a small region, due to differences in factors like risk bearing ability, technology use, indebtedness (Carpenter, 1975), caste, and social category (APROSC, 1985). Hence, identification of a target group should be in terms of category, number, location and other attributes (World Bank, 1975). Under-employment resulting from the seasonal nature of agriculture, is also a major problem in an agriculture-based economy. In rural areas of Nepal, levels of under-employment among households under the poverty line is as high as 63 percent (Pradhan, 1981) These findings form the basis of the present study.

OBJECTIVES AND HYPOTHESES

The objectives of this study were:

i) to study the impact of SFDP on income, consumption, employment, and asset formation among its beneficiaries;

ii) to examine if there are different responses to the SFDP by different categories of villagers and to identify factors responsible for such differential responses;

iii) to examine whether there exists a difference in benefits derived from the SFDP by different beneficiaries and if so, to identify the factors responsible;

iv) to suggest suitable policy alternatives.

It was hypothesised that:

i) SFDP has increased the income, consumption, employment, and assets of the beneficiary households:

ii) there is a differential response to the SFDP and a difference in benefits derived by various beneficiaries.

METHODOLOGY

The SFDP in Ramnagar, Nawalparasi district was purposely selected for study because it is one of the leading SFDPs benefitting both hill and Tarai small farmers. Among its coverage of 1322 households, 371 were considered for an impact study based on a minimum benefit period of two and a half years. Out of 371 households, 234 (63 percent) were hill beneficiaries (HB) and 137 (37 percent) Tarai beneficiaries (TB). An overall sample of 120 beneficiaries and 30 non-beneficiaries (NB) was used for the study. Sample beneficiaries were distributed among hill and Tarai beneficiaries proportionately, and 75 HB and 45 TB were randomly selected. Also, from hill non-beneficiaries (HNB) and Tarai non-beneficiaries (TNB) a fixed sample of 15 each was randomly selected. Primary sample data was collected in January-March of the agricultural year 1982-83. Conventional analysis, discriminant function analysis and regression analysis were used as tools to fulfill the objectives and hypotheses.

FINDINGS

In general, beneficiaries had more land and assets than non-beneficiaries (Table I). They used more inputs, produced more output, and used their land more intensively than non-beneficiaries. Tarai villagers had more land holdings than hill villagers. It was found that 81.3 percent of HB, 62 percent of TB, 54 percent of HNB and 31 percent of TNB cultivators used fertilizers.

Table I. General Sample Characteristics

	Beneficiaries			Non-Benefic.			Level of Sign.				
	HB	TB	All	HNB	TNB	All	B& NB	HB& HNB	TB& TNB	HB& TB	HNB& TNB
Family Size (No)	6.5	7.2	6.7	6.5	7.2	6.8					
Literacy (Percent)	60	34	50	46	25	35					
Ec.Active F.Members	2.9	3.9	3.3	2.9	3.9	3.4					
T.Assets (Rs.000)	105	70	93	55	41	48	**	**	*	**	*
Land Holding (Ha)	0.9	1.0	0.9	0.5	0.6	0.6	**	**	*	**	NS
Crop Intensity (%)	224	180	204	196	181	187	NS	NS	NS	NS	NS
Var. Cost/Ha (Rs.00)	21	17	19	16	15	15	**	**	NS	**	NS
Bullock/Mac. power	6.5	7.3	6.8	6.7	6.5	6.6					
Labor	7.8	6.4	7.3	5.5	5.5	5.2	**	**	NS	**	NS
Seed	2.5	1.9	2.2	1.8	1.2	1.5	**	**	NS	**	NS
Manure	0.9	0.8	0.8	0.9	1.0	0.9					
Fertilizer	2.9	0.6	2.2	1.0	0.5	0.8	**	**	NS	**	*
Productivity (quintal/ha)											
Rice	21	14	19	19	10	14	**	NS	**	**	**
Wheat	16	10	14	7	5	6	**	**	**	**	NS
Lentil	4.3	4.2	4.2	2.7	2.7	2.7	**	**	**	NS	NS
Oilseeds	3.3	2.5	3.0	2.3	1.7	1.9	**	**	**	*	NS

* Significant at 5 percent level; ** significant at 1 percent; NS not significant.

LOANS

Loans were an important factor improving farmers' economic status. Information on loans is presented in Table II.

Table II. Average Borrowing by Beneficiaries (Rs.000)

Year	1977-80		1980-81		1981-82		1982-83		Total	
Purpose	HB	TB	HB	TB	HB	TB	HB	TB	HB	TB
Produc-	0.7	0.1	1.9	0.2	15.2	1.7	8.5	3.3	16.4	5.3
tion	(4)	(1)	(15)	(4)	(32)	(30)	(45)	(81)	(25)	(23)
Irriga-	0.8	--	0.3	--	0.1	2.2	--	--	1.2	2.2
tion	(4)	--	(3)	--	(1)	(40)	--	--	(2)	(10)
Live-	12.7	3.0	7.8	2.8	7.7	0.6	8.9	0.5	37.2	6.8
stock	(67)	(39)	(63)	(45)	(48)	(10)	(47)	(13)	(56)	(29)
Milch	7.1	1.8	6.3	1.8	6.4	0.4	8.2	--	28.0	4.0
animal	(37)	(23)	(51)	(29)	(40)	(8)	(44)	--	(42)	(17)
Goat	5.3	0.5	1.5	0.7	0.9	--	0.1	0.4	7.8	1.5
	(28)	(6)	(12)	(11)	(5)	--	(1)	(9)	(12)	(7)
Pig	0.2	0.5	0.1	0.2	.04	.08	0.1	--	0.4	0.7
	(1)	(6)	(1)	(3)	(.2)	(1)	(1)	--	(1)	(3)
Fish	0.3	0.1	--	--	0.2	--	0.4	--	0.9	0.1
	(1)	(2)	--	--	(1)	--	(2)	--	(1)	(1)
Poultry	--	.07	--	.12	.16	.04	--	.18	.16	.41
	--	(1)	--	(2)	(1)	(1)	--	(4)	(.2)	(2)
Imple-	--	--	--	--	--	--	.13	--	.13	--
ment	--	--	--	--	--	--	(1)	--	(.2)	--
Market-	--	0.2	--	--	.04	--	.07	--	.11	.22
ing	--	(3)	--	--	(.2)	--	(.4)	--	(.2)	(1)
Land	0.8	1.3	0.3	--	0.1	--	--	--	1.3	1.3
	(4)	(17)	(2)	--	(1)	--	--	--	(2)	(5)
Bullock	3.7	2.9	2.0	3.2	1.3	1.1	1.2	.22	8.3	7.4
cart	(19)	(38)	(16)	(52)	(8)	(20)	(7)	(5)	(12)	(32)
Cnsmptn	1.2	0.5	0.6	0.6	0.3	--	0.7	0.4	2.8	1.4
Cottage	0.4	--	--	--	0.7	--	--	--	1.1	--
Ind	(2)	--	--	--	(5)	--	--	--	(2)	--
Loan	--	0.2	--	--	--	--	--	--	--	0.2
Pymt	--	(1)	--	--	--	--	--	--	--	(1)
Biogas	--	--	--	--	.93	--	--	--	.93	--
	--	--	--	--	(6)	--	--	--	(1)	--
Total	19	7	12	6	16	6	19	4	67	23
Borrow-	48	22	55	14	45	26	49	19		
er s(no)	(64)	(49)	(73)	(31)	(60)	(58)	(65)	(42)		

Figures in parentheses indicate the percentage to total.

Table II indicates that hill beneficiaries were more inclined towards borrowing. In any year, more than 60 percent of HBs and less than 50 percent of TBs borrowed. Also, HBs borrowed significantly higher amounts than TBs. Maximum amounts were borrowed for livestock followed by production purposes and bullock purchasing. Patterns of borrowing indicate that the financial activities of SFDP were centered around agriculture. Borrowing for enterprises like cottage industries and biogas (for running a rice mill) was done by HBs only, indicating their innovative attitudes.

TRAINING

Training small farmers in new skills and self-employment was a vital aspect of SFDP. Table III shows the numbers and kinds of training given to the beneficiaries.

Table III. Training Received by Small Farmers

Training	Trainings Received By	
	HB	TB
Crop Production	17	2
Fishery	0	1
Pig	1	0
Duck farming	1	1
Veterinary	3	0
Handloom	2	1
Carpentry	0	1
Group concept	4	0
Accounting	5	0
Total	33	6
No.of sample members trained	20	4
Percentage of trainees to total sample	27	9

On the average, hill beneficiaries received more training than Tarai beneficiaries. Production and veterinary programs were provided to hill beneficiaries because of their inclination towards improved farming practices and better livestock management.

INCOME

The average gross income of the sample households is shown in Table IV. Beneficiaries (both HB and TB) earned significantly higher incomes than non-beneficiaries. HBs received significantly higher incomes than TBs.

On-farm income was the most important source for all hill beneficiaries. HB spent seven percent more on inputs, managed the production plan better than TBs and received 45 percent higher crop income than TBs. This could also be a result of the seed multiplication program, which was provided solely to hill beneficiaries.

Tarai people (TB and TNB) depended more on off-farm income than hill respondents.

Beneficiaries (both HBs and TBs) received significantly higher non-farm income than NBs (both HNBs and TNBs). The difference between HNBs and TNBs was not significant. The difference between HBs and TBs was found to be highly significant, which could be due to the fact that HBs borrowed more than TBs, had more service opportunities than TBs and 21 percent of them had income sources from their hill properties and military pensions.

PER CAPITA NET INCOME

The average per capita net income of the sample households is shown in Table V. Differences in per capita net income between beneficiaries and non-beneficiaries and between hill and Tarai beneficiaries were statistically significant. Differences between hill and Tarai non-beneficiaries were not significant.

To determine the impact of the SFDP on the beneficiary small farmers, per capita loans (except production loans) borrowed in the current year were deducted from per capita net income. This indicated that 76 percent of the HBs and 62 percent of the TBs received net incomes of more than Rs.950.

The Gini ratio was 0.36 for per family income and 0.28 for per capita income distribution. This suggests that income distribution is not severely unbalanced.

Table IV. Gross Income of Sample Households (Rs.000)

	Beneficiaries			Non-Benefic.			Sign. Level				
	HB	TB	All	HNB	TNB	All	B& NB	HB& HNB	TB& TNB	HB& TB	HNB& TNB
1.Crop	9.5	6.5	8.0	4.9	4.0	4.4					
	(49)	(40)	(45)	(47)	(37)	(42)					
2.Live-stock	2.8	2.3	2.5	1.9	1.5	11.7					
	(14)	(14)	(14)	(18)	(14)	(16)					
1+2	12.3	8.8	10.5	6.7	5.5	6.1	**	**	*	**	NS
	(64)	(53)	(58)	(65)	(50)	(57)					
3.Hired Labor& Bullock Power	0.8	3.6	2.3	1.2	3.8	2.5					
	(4)	(22)	(13)	(11)	(35)	(23)					
4.Others	0.3	0.3	0.3	0.2	0.3	0.3					
	(1)	(2)	(2)	(2)	(3)	(2)					
3+4	1.1	3.9	2.6	1.4	4.1	2.7	NS	NS	NS	**	**
	(6)	(24)	(14)	(13)	(38)	(26)					
5.Busi-ness	0.6	1.2	0.9	0.8	0.5	0.7					
	(3)	(7)	(5)	(8)	(5)	(6)					
6.Ser-vices	0.8	0.5	0.7	0.2	--	0.1					
	(4)	(3)	(4)	(2)	--	(1)					
7.Others	1.8	1.1	1.6	0.7	0.6	0.6					
	(9)	(7)	(9)	(7)	(5)	(6)					
8.Borrow-ing	2.6	1.0	1.8	0.7	0.2	0.4					
	(14)	(6)	(10)	(6)	(2)	(3)					
5+6+7+8	5.8	3.8	4.9	2.3	1.3	1.8	**	**	**	**	NS
	(30)	(23)	(27)	(22)	(12)	(17)					
Total	19.2	16.5	18.0	10.4	10.8	10.6	**	**	**	**	NS

Figures in parentheses are percentages. * Significant at 5 percent; ** Significant at 1 percent; NS Not significant.

Table V. Per Capita Net Income of Sample Households (Rs.00)

Beneficiaries			Non-Benefic.			Sign. Level				
HB	TB	All	HNB	TNB	All	B& NB	HB& HNB	TB& TNB	HB& TB	HNB& TNB
16.0	11.8	14.4	8.5	8.2	8.3	**	**	*	**	NS

* Significant at 5 percent; ** Significant at 1 percent; NS Not significant.

As indicated by the scatter diagram, a linear multiple regression model was estimated to study the factors that would explain the variation in income. Estimated income functions for HBs, TBs and NBs were as follows:

YHB = -13.05 -0.15X1 +0.02X2 +1.00X3 +0.07X4 +0.14X5 +0.03X6
NS NS NS ** * * NS
(R^2=0.91)

YB = 0.36 -0.86X1 +0.01X2 +1.30X3 +0.03X4 +0.16X5 -0.00X6
NS NS NS ** * * NS
(R^2=0.96)

YNB = 1.46 -1.69X1 +0.00X2 +0.93X3 +0.02X4 +0.15X5 -0.00X6
NS NS NS * NS * NS
+0.16X7
NS
(R^2=0.89)

where:

Y = Gross income in Rs.000
X1 = Land holdings in hectares
X2 = Cropping intensity
X3 = No. of economically active family members (NEAFM)
X4 = Total assets in Rs.000
X5 = Total variable cost in Rs.00
X6 = Price index
X7 = 1 if hill; = 0 if Tarai

Note: ** significant at one percent level; * significant at 5 percent; NS not significant.

The statistical results of the above three income functions showed that three variables--NEAFM, total assets, and total variable costs--significantly influenced the income of the beneficiary households. Within the NBs, only the NEAFM and total variable costs influenced the income significantly. Second order econometric tests showed that the condition of zero mean and homoscedasticity were maintained whereas normality was violated (however, a large sample size would guarantee asymptotic properties).

CONSUMPTION

Beneficiaries, both HBs and TBs, spent more on consumption than non-beneficiaries (Table VI). Differences were not significant between TBs and TNBs and HNBs and TNBs.

Table VI. Annual Consumption Expenditure Per Consumption Unit (Rs.000)

	Beneficiaries			Non-Benef.			Level of Sign.				
	HB	TB	All	HNB	TNB	All	B& NB	HB& HNB	TB& TNB	HB& TB	HNB& TNB
Food	10.7 (63)	9.9 (71)	10.4 (62)	9.6 (69)	9.0 (73)	9.3 (71)	*	NS	NS	NS	NS
Clothing	2.9 (17)	1.8 (13)	2.5 (15)	1.6 (11)	1.3 (11)	1.5 (11)	**	**	*	*	NS
Fuel & Lighting	1.0 (6)	0.9 (6)	0.9 (6)	0.9 (6)	0.7 (5)	0.8 (6)					
Housing	0.1 (.5)	0.2 (2)	0.1 (1)	0.3 (2)	0.3 (2)	0.3 (2)	NS	*	NS	NS	NS
Health	0.4 (2)	0.4 (3)	0.4 (2)	0.3 (2)	0.3 (2)	0.3 (2)	*	*	*	NS	NS
Education	0.4 (2)	0.1 (1)	0.3 (2)	0.2 (1)	0.1 (1)	0.1 (1)	**	**	NS	**	*
Social	0.7 (4)	0.4 (3)	0.6 (4)	0.3 (2)	0.3 (2)	0.3 (2)	**	**	NS	**	NS
Misc	1.0 (6)	0.4 (3)	0.8 (5)	0.9 (6)	0.4 (3)	0.7 (5)	*	*	*	*	*
Total	17.0	14.0	15.9	14.0	12.3	13.1	**	*	NS	**	NS

Note: * Significant at 5 percent level; ** Significant at one percent level; NS Not significant. Figures in parentheses indicate percentage.

Expenditures on consumption showed no marked change in food habits among the sample households but there was a conspicuous increase in expenditure on clothing by beneficiaries. The hill population invested much more in the education of their children than Tarai people did. They also spent more on social obligations than Tarai people.

The Gini ratio was 0.20, indicating that the distribution of consumption expenditures was not severely skewed.

A linear multiple regression model, as indicated by a scatter diagram, was used to understand the variation in consumption under the influence of specified variables. The estimated consumption functions for HBs, TBs and NBs were as follows:

$$CHB = \underset{NS}{4.47} + \underset{**}{4.25}X1 + \underset{NS}{7.61}X2 + \underset{NS}{0.04}X3 \qquad (R^2=0.90)$$

$$CTB = \underset{NS}{9.54} + \underset{**}{7.54}X1 + \underset{**}{6.61}X2 + \underset{**}{0.17}X3 \qquad (R^2=0.88)$$

$$CNB = \underset{NS}{-3.85} + \underset{**}{6.97}X1 + \underset{**}{3.51}X2 + \underset{NS}{0.01}X3 + \underset{**}{5.66}X4 \qquad (R^2=0.97)$$

where C = Consumption expenditure in Rs.00
X1 = Disposable income in Rs.000
X2 = Family size in consumption unit
X3 = Total assets in Rs.000
X4 = 1, if hill; = 0, if Tarai
** = Significant at one percent level
NS = Not significant

The above consumption functions show that disposable income and family size significantly influenced the consumption expenditure of all households irrespective of category. Hills households tended to spend more than Tarai households among non-beneficiaries.

A second order econometric test of residuals showed that the assumptions of zero mean and homoscedasticity were maintained whereas normality was violated. However, asymptotic properties would be guaranteed by a large sample size, so the estimates are valid for interpretation.

ASSETS

The pattern of asset holdings (Table VII) was studied to understand the income-generating capacity of the sample households.

Table VII. Per Capita Asset Holdings (Rs.000)

	Beneficiaries			Non-Benefi.			Level of Sign.				
	HB	TB	All	HNB	TNB	All	B& NB	HB& HNB	TB& TNB	HB& TB	HNB& TNB
Land	121 (79)	74 (79)	103 (79)	76 (75)	72 (81)	74 (78)	**	**	NS	**	NS
Building	16 (10)	9 (10)	13 (10)	13 (13	9 (10)	11 (11)	NS	*	NS	**	*
Implement	0.8 (.5)	0.8 (.9)	0.8 (.6)	0.5 (.5)	0.7 (.8)	0.6 (.6)	NS	NS	NS	NS	NS
Livestock	9.5 (6)	6.2 (7)	8.3 (6)	6.4 (6)	4.9 (6)	5.7 (6)	**	**	NS	**	NS
Current Assets	6.7 (4)	3.4 (4)	5.0 (4)	5.8 (6)	2.7 (3)	4.3 (4)	NS	*	NS	**	NS
Total	151	93	130	102	89	95	*	**	NS	**	NS

Figures in parentheses indicate percentages. NS Non-significant; * Significant at 5 percent level; ** Significant at one percent.

It was found that the beneficiaries owned assets worth Rs.12,990 per capita which was significantly more than the assets of non-beneficiaries. Hill beneficiaries owned more assets than Tarai benefiaries. However, the differences of asset possession between TBs and TNBs, and HNBs and TNBs were not significant. Land was the most dominant asset followed by buildings and livestock. HBs had much higher asset holdings than TBs, HNBs and TNBs, indicating higher levels of assets in HB households in the SFDP.

The Gini ratio was 0.42, which indicated that the distribution of assets was skewed though not severely.

EMPLOYMENT

Several studies have indicated that in most developing countries, agricultural sectors have a high level of under-employment and disguised unemployment (see Table VIII).

Table VIII. Employment Patterns

	Beneficiaries			Non-Beneficiaries		
	HB	TB	All	HNB	TNB	All
Available mandays	208.4 (100)	224.3 (100)	214.4 (100)	226.7 (100)	243.9 (100)	235.3 (100)
Employed mandays	136.7 (66)	153.0 (68)	142.7 (67)	142.2 (63)	165.2 (68)	153.7 (65)
On-farm	105.3	79.8	95.9	80.4	68.4	73.9
Off-farm	14.0	58.0	29.2	26.2	78.3	50.0
Non-farm	17.4	15.3	17.6	35.6	18.5	29.8
Level of un-employment	71.7 (34)	71.3 (32)	71.7 (34)	84.5 (37)	78.7 (32)	81.6 (35)

Note: Figures in parentheses indicate percentages.

RISK-BEARING ATTITUDE

Differences observed between HBs and TBs regarding various economic variables included the need of reasoning. The risk-bearing attitudes of the beneficiaries were expected to explain the differences in approach towards economic and social activities undertaken by HBs and TBs.

Under scaling technique, a series of questions regarding farming, finance, and insurance carrying various degrees of risk were posed to the beneficiaries. The scores for different responses were standardized, and averages are presented in Table IX.

Table IX. Risk-Bearing Attitude of Beneficiaries

Group	Scores	't'	Remark
HB	13.53		Difference signifi-
TB	10.17	7.8121	cant at one percent.

This table shows that HBs were willing to undertake more risks than TBs in situations of uncertainty. The lower risk bearing attitudes of the TBs could be a result of their lower education status (Table I).

COVERAGE

Out of 590 small farmer hill households and 719 Tarai households in the SFDP area, 476 (75 percent) of the hill and 372 (39 percent) of the Tarai households had benefitted from the SFDP over the project period. This shows the lagged response of the Tarai farmers towards SFDP. Social factors like lower education status and the lower risk-bearing attitudes of the Tarai people in comparison with the hill people could explain their poorer response.

DISCRIMINANT FUNCTION ANALYSIS

A detailed analysis of the characteristics and responses to policy incentives of the sample households identified three major factors--risk-bearing attitude, asset possession and crop productivity--as causes for the differences and were used to discriminate between the HB and TB.

The estimated function was as follows:

$$z = 24.93X1 + 1.65583X2 + 4.4907X3$$

where X1 = Risk bearing attitude
X2 = Asset posssesion (Rs.000)
X3 = Crop productivity (quintal/ha)

Analysis of variance:

Source of variation	Sum of squares	Degrees of freedom	Mean square	'F' value
Between groups	0.6722	3	0.2241	172.38**
Within groups	0.1546	119	0.0013	

** Significant at one percent level.

The 'F' statistic indicates that the estimated function showing variation between the groups was highly significant. Coefficients show that hill beneficiaries took more risks, had larger asset possession and enjoyed higher crop productivity. Among these three characteristics, risk-taking was the most distinguishing feature, followed by productivity and asset possession. It indicated that the program would be more successful if the Tarai households were provided with some sort of protection and/or compensation for the risks they undertook to their production plans and other enterprises.

ATTITUDE OF THE SFDP STAFF

The differential impact of SFDP on various economic variables of the hill and Tarai households and their differential response towards SFDP could have been due to differences in their own attitudes or due to the bias of the SFDP staff. Hence, respondents were asked to react to the attitudes of the staff. The result indicated that whatever differences existed between HBs and TBs regarding the impact of SFDP, they were due to differences in their own attitudes and had no relationship to the SFDP staff.

CONCLUSION

Based on the above findings, the following conclusions were drawn:

The SFDP was found to have had a significant impact on the income, consumption and asset holdings of beneficiaries. This impact was more noticeable on hill households than on Tarai households, whose consumption and asset level had not increased significantly.

The activities of SFDP did not improve the employment status of the beneficiaries significantly, because the projects undertaken by small farmers centered around agriculture, which is seasonal, as a result of which economically active people remained unemployed for as many as five months a year. Unemployment was more of a problem for hill households than for Tarai ones, as they were not accustomed to going for 'bhota' (bounded labor life).

A better response towards SFDP was found among small hill farmers than among those from the Tarai. The greater participation of hill households was attributed to their higher risk-bearing attitude.

POLICY IMPLICATIONS

The results and conclusions of this study have the following implications for SFDP policy.

A diversification of enterprises from the agricultural to the non-agricultural sector seems to be crucial. Continuous income-yielding low-cost enterprises such as shops, tea stalls, trading and various kinds of local specific cottage industries would be best.

Small farmers from the Tarai should be strongly encouraged to participate in the development process in order to avoid any possibility of the emergence of a serious socio-economic gap between the hill and Tarai small farmer households. First, their conceptual horizons should be broadened through training, demonstrations, population education, formal education, and government services. This will increase their risk-bearing ability. Second, credit should be provided to involve them in different economic activities which will raise their standard of living.

NOTES

Small farmers are defined as those having a per annum per capita net income of less than Rs.950.

Gross income is comprised of:

(i) Agricultural: on-farm and off-farm income, and sales of farm assets; and

(ii) Non-agricultural incomes: such as the income from services, self-employment activities, sale of non-farm assets, gifts received and borrowing from institutional and non-institutional sources.

Net income is defined as gross income less the variable costs of inputs involved in all economic activities undertaken by small farmers both in cash and kind, and other fixed charges such as land revenue, interest on loans, rental value of leased-in land, and depreciation.

Assets are defined as capital goods which help in the generation of further income, and consumer durables. Asset formation is defined as the increase in value of the assets of beneficiary groups over those of non-beneficiary groups.

Consumption is defined as expenditure on food (including beverages and narcotics), clothing, fuel and lighting, housing, medicine, education, and non-recurring expenses for social and religious functions.

Full employment is defined as the fuller utilization of available family labor in different income yielding sectors during an agricultural year, taking 323 working days of eight hours each per person per year for each economically active family member.

The risk-bearing attitude of the small farmer was measured by his/her ability to make decisions under conditions of uncertainty, especially against the shock of probable financial losses.

REFERENCES

APROSC, "Sociological Aspects of Small Farmers Development Programme: A Case Study of Kahubhalam SFDP Kaski District," January 1985.

Carpenter, N.R., "Small Farmers Development: The Problem and The Programme From a Farm Management Perspective," Farm Management Notes for Asia and the Far East No.1:3, July 1975.

Gaige, F.H., Regionalism and National Unity in Nepal, London: University of California Press, 1975.

National Commission on Population (NCP), "Population Data of Nepal At a Glance," Kathmandu, 1983.

World Bank, "Rural Development: The World Bank's Approach to Helping the Small Farmers," Farm Management Notes For Asia and Far East, No.1:10, July 1975.

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