AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Vol XXVII
No. 4

ISSN 0019-5014

CONFERENCE
NUMBER

OCTOBER-
DECEMBER
1972

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

INCOME, SAVINGS AND ECONOMIC RATIONALE OF INVESTMENT IN TRIBAL AGRICULTURE OF NAINITAL TARAI: A COMPARATIVE STUDY*

J. P. Bhati, T. V. Moorti, L. R. Singh and K. K. Verma

Department of Agricultural Economics
G. B. Pant University of Agriculture and Technology, Pantnagar (Nainital)

INTRODUCTION

Dynamic changes have taken place in agriculture with the evolution of high-yielding varieties and adoption of modern and improved farm practices. There is highly complementary package of inputs associated with the new farm technology. This package includes irrigation and water control, fertilizers, and methods to control weeds, diseases and pests. The high-yielding varieties of crops have a high response potential for these new inputs. A new dimension of investment problem both short run and long run has sprung up to meet the requirements of these modern agricultural inputs. It is the investment pattern in addition to technological 'know-how' in the present day agriculture which may forecast the fate of the crop incomes and finally the standard of living of the farmer.

In the tarai region of Nainital district whereas some sections of the farm population have been able to increase their standard of living enormously, the tribals who cultivate a substantial portion of tarai land, have lagged much behind. The present study was undertaken specially with two objectives: (*a*) to estimate the level of incomes and savings on the tribal and non-tribal farms and (*b*) to examine whether the investment pattern is consistent with economic rationality.

METHODOLOGY

Four tribal and two non-tribal villages were randomly selected from Khatima block of Nainital district. Forty farms from the tribal villages and twenty farms from the non-tribal villages were randomly selected. The average size of the tribal and non-tribal farm was 11.97 and 10.61 acres respectively.

---

* This paper is based on the thesis entitled "A Study of Socio-Economic Aspects of Tribal Agriculture of Tarai (U.P.)" submitted to the G. B. Pant University of Agriculture and Technology, Pantnagar (1971) by the senior author in partial fulfilment of the requirements for the degree of M.Sc. Ag. (Agricultural Economics).

The senior author expresses his gratitude to the Indian Council of Agricultural Research, New Delhi for awarding a fellowship which enabled him to conduct this study.

A Cobb-Douglas production function with the following variables was used to examine the allocational efficiency of capital on different inputs:

$$Y = a\ X_1^{b_1}\ X_2^{b_2}\ X_3^{b_3}\ X_4^{b_4}$$

where Y = Total crop income,
X_1 = Expenditure on HYV seeds, fertilizers and irrigation,
X_2 = Expenditure on human labour (family + hired),
X_3 = Operated area,
X_4 = Expenditure on bullock labour,

a is a constant term. b_1 to b_4 are production elasticities.

To compare the marginal propensity to save between the tribal and non-tribal farms savings functions were fitted as follows:

$$S = a + b\ Y_d$$

where S = Savings,
Y_d = Disposable income.

RESULTS AND DISCUSSION

Income and Savings

There is striking difference between the levels of agricultural income of the tribal and non-tribal farms. The non-agricultural income constitutes a minor part of the total income on both types of farms. The working expenditure on the farms of non-tribals is about four times higher than that of the tribal farms (Table I). Since the level of consumption expenditure does not differ substantially between the two types of farms, the disposable incomes are about three times higher on the non-tribal farms than that on the tribal farms.

TABLE I—INCOMES AND SAVINGS DURING 1970-71

(*Rs./farm*)

Type of farms	Income			Working expenditure on farms	Disposable income	Consumption expenditure	Savings
	Agricultural	Off-farm	Total				
Tribal	4,065	185	4,250	677	3,573	2,962	611
Non-tribal ..	7,381	50	7,431	2,538	4,903	3,040	1,863

Savings function

Tribal $S = -360 + 0.2719^{**}\ Y_d$ (0.1035)

Non-tribal $S = -35 + 0.3892^{**}\ Y_d$ (0.1605)

** Significant at 5 per cent level of probability.

From the estimated saving functions it can be stated that for the non-tribals an increase of every additional rupee of disposable income will give a saving of Re. 0.39. On the contrary, the tribal farms save about Re. 0.27 for every additional increase of one rupee in their disposable income. This suggests that the marginal propensity to save on the non-tribal farms is about 50 per cent more than on the tribal farms. Thus any increase in incomes on the non-tribal farms would result in higher saving which could be made available for further investment in agriculture. This self-generating investment potential is relatively lower on the tribal farms.

Investment Pattern

Agricultural investment is of mainly two types: (1) short-term for inputs like HYV seeds, fertilizers and chemicals, irrigation operations, working expenses for machinery and livestock ; (2) long-term investment on fixed capital assets like irrigation equipment, machinery, livestock, etc.

Table II reveals that the total working expenditure on the non-tribal farms is about four times higher than that of the tribal farms. This disparity can be attributed to higher levels of expenditure on HYV seeds, fertilizers, irrigation, hired labour on the non-tribal farms as compared to the tribal farms.

TABLE II—SHORT-TERM INVESTMENT: 1970-71

Inputs of expenditure	Tribal farms			Non-tribal farms		
	Per acre (Rs.)	Per farm (Rs.)	Percentage of total	Per acre (Rs.)	Per farm (Rs.)	Percentage of total
1. HYV seeds	0.41	5	0.74	17.93	190	7.49
2. Fertilizers	3.33	39	5.76	55.37	587	23.13
3. Irrigation	3.30	40	5.91	40.10	426	16.78
4. Hired labour	33.59	402	59.38	94.01	977	38.49
5. Livestock	12.45	149	22.0	21.91	232	9.14
6. Others	3.45	42	6.2	9.91	106	4.18
Total	56.53	677	100.00	239.33	2,538	100.00

Thus farming on the tribal farms can be said to be labour intensive because of a higher proportion of expenditure on hired labour. On the contrary, the non-tribal farms are capital intensive because of a relatively higher expenditure on modern agricultural inputs like HYV seeds, fertilizers and irrigation. It may be noted here that the family members engaged in agriculture on the tribal and non-tribal farms were 4.5 and 4.4 man-equivalents respectively.

TABLE III—LONG-TERM INVESTMENT PATTERN

Items	Tribal farms					Non-tribal farms				
	Total investment*		Current investment†		Current investment as per cent of total investment	Total investment*		Current investment†		Current investment as per cent of total investment
	Actual (Rs.)	Per cent	Actual (Rs.)	Per cent		Actual (Rs.)	Per cent	Actual (Rs.)	Per cent	
Livestock	2,165	40	138	17	6	2,098	24	380	24	18
Irrigation equipment	549	10	261	33	48	2,404	27	450	29	19
Machinery	290	5	27	4	9	2,368	27	713	46	30
Farm buildings	2,427	45	367	46	15	1,915	22	15	1	1
Total	5,431	100	793	100	15	8,785	100	1,558	100	18

* Total investment is the estimated per cent value of all farm assets, upto the end of 1970-71.

† Current investment refers to the investment during 1970-71.

Long-term Investment

Table III indicates that the level of net capital investment during 1970-71 on livestock, irrigation equipments, machinery, farm buildings was Rs. 1,558 on the non-tribal farms which is about twice the investment made by the tribal farms. The tribal farms have made the highest investment on farm buildings whereas the non-tribal farms on the purchase of farm machinery. The important item for investment on the non-tribal farm was irrigation equipment.

The per farm total investment upto the end of 1970-71 on irrigation equipment (Rs. 2,404) and farm machinery (Rs. 2,368) on the non-tribal farms was about four and eight times greater than that on the tribal farms, respectively. Thus the low level of investment on these two items by the tribal farms shows their traditionally oriented farming system of working at a low capital base.

However, the current investment on irrigation equipment on the tribal farms was 48 per cent of the total investment on irrigation equipment. This large proportion indicates that the tribal farmers are now realizing the importance of this vital input, because irrigation is a pre-requisite for adopting other modern inputs specially HVY seeds and fertilizers.

The elasticity coefficient with respect to capital expenditure on the tribal farms is statistically insignificant because of the erratic and inadequate amount of capital use on these farms (Table IV). The tribal farms are very irrational

TABLE IV—REGRESSION COEFFICIENTS, MARGINAL VALUE PRODUCTS AND FACTOR COST RATIO OF DIFFERENT FARM INPUTS: 1970-71

Resource		Regression coefficients		Marginal value product		MVP-Factor cost ratio	
		Tribal farms	Non-tribal farms	Tribal farms	Non-tribal farms	Tribal farms	Non-tribal farms
Capital expenditure	(X_1)	0.03348 (0.03000)	0.10059** (0.03562)	5.63	1.82	5.36	1.74
Expenditure on human labour	(X_2)	0.26827* (0.13397)	0.12521 (0.24693)	0.34*	0.20*	0.32	0.19
Operated area (acres)	(X_3)	0.37658** (0.18386)	0.44772** (0.18959)	49.75	104.77	0.50	1.05
Expenditure on bullock labour	(X_4)	0.36752** (0.14061)	0.33532** (0.14283)	0.81	1.40	0.81	1.40

Note: Figures in parentheses are standard errors.
R^2 values of the functions of tribal and non-tribal are 0.705 and 0.855.
** Significant at 5 per cent level of probability.
* Significant at 1 per cent level of probability.

in making investment on production increasing items of expenditure like high-yielding varieties of seeds, fertilizers and irrigation water. On the other hand, the non-tribal farms are relatively more conscious of investment on such inputs to augment their incomes. The production elasticity attributed on the non-tribal farms is statistically significant.

A comparison of the ratios of marginal value product to its factor cost on capital expenditure, human labour and bullock labour on the tribal farms indicates that there is scope for increasing investment on capital expenditure such as fertilizers, high-yielding varieties of seeds, irrigation charges by diverting funds from hired human labour and bullock labour. Funds could also be diverted towards investment for the aforesaid items of capital expenditure.

The ratio of marginal value product to acquisition cost for different resources on the non-tribal farms indicates that re-allocation of expenditure on different resources is imperative. These farms also spend a substantial amount on bullock labour which needs to be diluted and diverted further to capital expenditure although they are spending more on capital expenditure items relative to the tribal farms.

CONCLUSIONS

From the product analysis it can be concluded that the marginal propensity to save on the tribal farms is lower relative to the non-tribal farms. The non-tribal farms invest about four times more than the tribal farms on items like fertilizer, high-yielding varieties and irrigation charges. On the contrary, tribal farming is more labour intensive. The tribal farms show irrational behaviour mainly in short-term investments on HYV seeds, fertilizers, irrigation, etc., but instead they have made heavy investment on farm building as against the expenditure on machinery and irrigation by the non-tribal farms. The current investment during 1970-71 on irrigation equipment on the tribal farms was 48 per cent of the total investment on irrigation upto the end of 1970-71 which indicates that the tribal farmers are becoming more and more conscious of investment on this vital farm input. This further suggests that the tribal farmers should increase the investment on short-term inputs like HYV seeds, fertilizers and long-term input on irrigation equipment by diverting funds from expenditure on farm building and hired human labour. On the other hand, the non-tribal farms should re-allocate their expenditure more on HYV seeds, fertilizers, irrigation by diverting expenditure from human labour.