A Test of Agricultural Transformation in Rupandehi District, Nepal

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INTRODUCTION

Agricultural transformation simply means a change in traditional agriculture. The traditional agriculture is a static stage in which the characteristics of agrarian sector are of specific nature and eventually do not help to speed up the rate of economic growth (Table 1).

Table 1
Summary of the Principal Characteristics of Growth in Agricultural Sector

Characteristics	Stage 1 (Static)	Stage 2 (Transitional)	Stage 3 (Dynamic)
I. Nature of decision making	Irrational		Rational or choice making
II. Rate of return	Low		High
III. Availability of organised institutions	Unavailable		Available
IV. Availability of irrigation facility	Low availability		High Availability
V. Availability of transportation facility	Low availability		High Availability
VI. Availability of facility for improving the knowledge of improved practices	Unavailable		Available
VII. Technology	Static or traditional		Dynamic or improved
VIII. Degree of commercialization of output	Low		High
IX. Capital intensity	Low		High
X. Availability of unused resources	Available		Unavailable
XI. Attitude of farmers	Resistant or pessimistic		Receptive or optimistic
XII. Goal of production	Subsistence		Profit

Source: Adopted and restructured from C.R. Wharton Jr; "Research on Agri-
cultural Development in South East Asia", Journal of Farm Econo-
mics, Vol. 45, No. 5, 1963, p. 1162.

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Stage 1 resembles the traditional agriculture, whereas Stage 3 is the modern (fully transformed) agriculture. Stage 2 shows the transition, i.e., the start of transformation. The nature of characteristics is not depicted because it is difficult to pin-point exactly. In earlier stage of transition, the nature of characteristics may be much similar to that of traditional agriculture. But at the final stage of transition, this generally goes to resemble the modern agriculture.

The existence of traditionalism in agriculture is a great impediment in the path of agricultural development, and hence overall economic development. So, the traditional agriculture must be transformed. But the question arises of what type and to what extent the transformation should be so that it can boost up the economic development desirably.

As far as the type of agricultural transformation is concerned, undoubtedly it should be positive. Whether the transformation is positive or negative, it can be ascertained with the help of the nature of characteristics mentioned earlier. If the nature of characteristics is changing towards Stage 3, it can be said that positive change is occuring. On the contrary, if the 'nature' is going to be more and more traditional, the change can said to be negative. But, even the positive transformation may not be helpful until the extent is desirable. How much can be taken as the desirable transformation and how much agricultural transformation has Rupandehi district realized? These are the questions which have been modestly dealt with, here.

OBJECTIVES

The following objectives have been put forward to be fulfilled:

a.   To ascertain the extent of desirable agricultural transformation.

b.   To ascertain the agricultural transformation in the Rupandehi district, Nepal.

CONCEPTUAL FRAMEWORK

Various concepts used in the study are as follows:

Characteristics and Their Factors (Variables)

The transformation of traditional agriculture means the change in the nature of characteristics which are altogether 12 (Table 1). Since each characteristic depends itself on certain factors (variables), its change means a change in them. The list of factors with their concerning characteristics is given below:

Factors	Characteristics
i. Use of improved seeds	Nature of decision-making
ii. Area under cash crop	
iii. Way of preparing compost fertilizer	

Factors	Characteristics
iv. Practice of secondary business	
v. Keeping written record	
vi. Going through agricultural literature	
vii. Use of market procured tools	
viii. Use of fertilizer nutrients	
i. Actual and desired production	Rate of return
i. Sources of loan	Availability of organised institutions
ii. Sources of selling product	
iii. Sources of procuring inputs	
i. Actual and desired irrigation facility	Availability of irrigation facility
i. Actual and desired transportation facility	Availability of transportation facility
i. Contact with extension personnels	Availability of facility for improving the knowledge of improved practices
ii. Radio programmes	
iii. Exhibitions and fairs attended	
iv. Documentary films seen	
v. Language of agricultural literature	
i. Use of fertilizer in right proportion	Technology
ii. Seed treatment	
iii. Nature of putting seeds into fields	
iv. Method of transaction	
v. Nature of processing agricultural products	
vi. Method of storing grains	
i. Practising farm related secondary business	Degree of commercialization of output
ii. Sale of production	
i. Capital cost in total cost of production	Degree of capital intensity
i. Cropping intensity	Availability of unused resources
i. Interest in documentary films	Attitude of farmers
ii. Interest in exhibitions/fairs	
iii. Interest in agricultural literature	

    iv. Desire to make sons daughters
       agriculturists

    v. Attitude towards the work in
      agriculture

   vi. Attitude towards the future of
      agriculture

  vii. Attitude towards the prestige of
      agriculturists

     i. Foodgrain crops   Goal of production

    ii. Cash crops.

Thus, it is found that all twelve characteristics have 38 factors altogether. If the change in all of them is full, i.e., 100 percent, it is said that agriculture is fully transformed. Similarly, if there is no change in them at all, i.e., zero percent, agriculture is taken fully traditional. The full change in factors means a complete positive change (i.e., the change which is fully helpful to foster the rate of agricultural development). For example, if it is found that farmers only use the improved seed, the change in the factor 'use of improved seed' is full (i.e., 100 percent) and vice-versa. If the value lies between 0 and 100, agricultural transformation may be said as primary or lower middle or upper middle or ultimate depending upon the stage in which it falls.

Stages of Agricultural Transformation

Four stages mentioned below have been imagined in agricultural transformation keeping in view the life cycle of a man which also has four stages (Ashramas) according to Hindu philosophy.

Primary Stage

It is the stage in which the value of agricultural transformation lies between 0-25 years. It resembles the Bachelor Stage (Brahmacharya Ashrama) which is assumed upto 25 percent of a man's age (approximately 25 years if a man's average age is taken 100 years as presumed in Hindu philosophy). This is the stage in which man is supposed to make a strong foundation of his life through education or alike business so that he can lead a better life in future. This is the stage at which he is not supposed to be helpful for his other family members. It means if one survives only upto or under this stage, he is not supposed to add anymore to the material well-being of his family members.

The same is true for the primary stage of agricultural transformation. If it is upto 25 years or below, it may not be supposed to contribute substantially to the economic growth of the economy.

Lower Middle Stage

This is the stage in which the value lies between 25-50 years. It resembles the Household Stage (Garhastha Ashrama). This stage remains upto 50 percent of the total age of a man. It is the stage in which a man is supposed to explore opportunities to be rich and prosperous so that he can be self-reliant in conducting his all economic and social activities which are to appear in his subsequent stage. Since this is the stage in which man is vigorously engaged in different fields, he does not confine himself only to one alternative. He continuously tries to look at many alternatives. Thus, this is the stage in which he becomes dynamic in the search of avenues for his material betterment. As he matures, his contribution to his material betterment increases. It means a man's contribution is minimum at the lower point, i.e., at the first half of this age.

The same is true for the lower middle stage of agricultural transformation. If agriculture is in this stage, it will help the economy to be self-dependent and will prepare a solid base for speeding up the rate of economic growth provided the agricultural transformation has crossed the first half of this stage (37.5 percent). If it is below that, its contribution to the economy will be minimum. Since this is the stage in which the agricultural transformation is not confined to only one alternative, it is termed as the lower middle stage assuming that agriculture has yet not touched the best alternative point.

Upper Middle Stage

This is the stage in which the 'value' lies between 50-75 years. It is similar to the Religious Stage (Banaprasthan Ashrama), which spreads upto 75 percent of a man's total age. Here a man is supposed to be stable in selecting the way for his material betterment. In this stage, man also starts to think for transcendental elevation. Thus, this is the stage in which he feels satisfied with his material efforts and tries to busy himself in some sorts of religious and social activities.

The same is true for the upper middle stage of agricultural transformation. Here, the concerning agencies become satisfied with their efforts in fostering the rate of agricultural development. This is the stage in which the agencies succeed to select the best alternative which helps to grow the non-agricultural sector also.

Ultimate Stage

In this stage, the value of agricultural transformation varies between 75 and 100 years. This resembles the Penance Stage (Sanyas Ashrama) which remains till the end of a man's life. This is the stage in which a man is supposed to be free from all his family and household obligations in the belief that his successors can carry them efficiently. He further tries to indulge himself, on the one hand, in such activities which may prove exemplary for others, and on the other, may help in providing him the eternal peace after his death.

The ultimate stage of agricultural transformation is also supposed to be free from further obligations of agricultural development because it would have reached to the highest point. Hence, the concerning agencies try to fully concentrate upon the development of other sectors (though the efforts for agricultural development of other sectors (though the efforts for agricultural development are continued on the basis of the best chosen alternative) so that the whole economy can be self-sustaining and exemplary for other economies.

The whole analysis of stages shows that the genuine agricultural transformation means at least 37.5 percent change in the nature of traditional agriculture.

Composite Index

In order to consolidate the values of all 'Characteristics' into one, the Composite Index has been developed. The Composite Index (CI) is the weighted average of all individual twelve characteristics that comprise various factors.

Symbolically, CI may be expressed as follows:

$$CI = \Sigma W_j I_j / \Sigma W_j$$

in which,

I_j = jth characteristic of agricultural transformation

W_j = Weight for jth characteristic

j = 1,2,3, ------------------, 12

The various numbers of factors (i.e. 8, 1,3,1,1,5,6,2,1,1,7,2) have been selected as the corresponding weights of different characteristics with the logic that a characteristic having more factors is more influential in transforming traditional agriculture.

METHODOLOGY

Primary data were collected in 1981-82 by interviewing altogether 298 farmers on the basis of stratified random sampling in the whole Rupandehi district. At the first stage, one of the two town panchayats (Siddharthanagar), and five out of remaining 42 village panchayats (Balrampur, Asuraina, Kerwani, Manpakadi and Anandban) had been selected. (At the time of survey, there were only 43 panchayats (presently 86) in the whole Rupandehi district). After that, 50 farmers had been selected from each panchayat (except in Balrampur and Anandaban where only 49 farmers had been taken from each) taking 38 (76 percent), 8 (16 percent) and 4 (8 percent) from small (marginal farmers are included here), medium and large farmers respectively. (The operational holding of small, medium and large farmers ranges from 0-4, 4-10 and above 10 bighas (6.7 hectares) respectively).

The collected data have been tabulated in the tune of Characteristics and Factors. The Mean, Standard Deviation and Coefficient of Variation of Composite Index have been used to analyse the data.

ANALYSIS OF STATISTICAL RESULT

The Mean (M) of Composite Index (CI) comes to be 31.16 showing that the agricultural transformation of the Rupandehi district has hardly crossed the Primary Stage and hence it is not genuine. The values of Standard Deviation (SD) and Coefficient of Variation (CV) come to be 312.77 and 1003.79 indicating a high degree of heterogeneity among different categories of farmers regarding the agricultural transformation (Table 2).

Table 2
M, SD and CV of CI in Rupandehi District for Agricultural Transformation

M, SD and CV of CI	Categories of Farmers			
	Large (24)	Medium (48)	Small (226)	All (298)*
M	44.82	34.22	29.10	31.16
SD	86.43	117.38	224.19	312.77
CV	192.82	343.03	770.50	1003.79

*Number of farmers in sample.

Source: Adapted from Appendix.

M of CI for large, medium and small farmers come to be 44.82, 34.22 and 29.10 respectively showing the genuine agricultural transformation only in the case of large farmers. The values of SD and CV for large, medium and small farmers are 86.43, 192.82; 117.38, 343.03 and 224.19, 770.50 respectively depicting that whatever transformation occured, it is not equally spread even among the same category of farmers. The heterogeneity regarding the agricultural transformation is greater for small farmers. It is less for large and moderate for medium farmers.

FINDINGS

The major findings are as follows:

a. The agricultural transformation may be called genuine if it has succeeded to change the characteristics of traditional agriculture by more than 37.5 percent.

b. The agricultural transformation in the Rupandehi district is only 31.16 percent showing that the transformation is yet not genuine.

    c. On the basis of categories of farmers, the agricultural transformation only for large farmers (who is in minority) has bben found genuine (44.82 percent).

    d. The agricultural transformation is not uniform even among the same category of farmers. It is highly uneven for small farmers. The unevenness is lower for large and moderate for medium farmers.

CONCLUSION

The agricultural transformation is a key factor in the economic development of a country like Nepal. As Nepal is making a slow pace toward, green revolution since the late sixties, it is necessary as well as relevant to assess the achievement in this direction. An effort has been made here to evaluate this on the basis of a case study of the Rupandehi district. It has been found that the agricultural transformation in the district has yet not been genuine. Though this result may not be exactly applied all over Nepal, undoubtedly the position of the whole country may not be better than 'Rupandehi' because it is one of all twenty Terai districts where the green revolution has been found with strong eminence than in other parts of the country. Hence more concerted efforts are needed all over the country if agriculture is to contribute to Nepal's overall economic development.

SELECTED REFERENCES

C.R. Wharton, Jr. (1963), "Research on Agricultural Development in South East Asia", Journal of Farm Economics, Vol. 45, No. 5.

N.L. Srivastava (1983), "Transformation of Traditional Agriculture in Developing Countries: A Case Study of Rupandehi District", an unpublished Ph.D. Thesis submitted to the Institute of Humanities and Social Sciences, Tribhuvan University.

APPENDIX

M, SD and CV of Characteristics and CI for Agricultural Transformation in Rupandehi District

Characteristics		Categories of Farmers			
		Large (24)	Medium (48)	Small (226)	All (298)*
I	M	31.07	21.89	23.18	23.61
	SD	63.11	104.57	177.76	220.56
	CV	203.12	477.68	766.91	934.28
II	M	56.04	56.83	50.84	52.22
	SD	107.44	152.10	257.84	325.92
	CV	191.71	267.63	505.91	624.12
III	M	29.44	10.46	3.44	6.59
	SD	116.68	103.31	116.34	230.21
	CV	396.32	988.05	3382.75	3494.49
IV	M	28.91	14.29	11.41	11.55
	SD	74.34	90.79	205.96	270.72
	CV	257.17	635.16	1805.03	2344.74
V	M	79.63	69.80	19.92	32.88
	SD	161.42	260.78	484.30	671.87
	CV	202.71	373.61	2431.80	2043.33
VI	M	44.72	22.30	12.33	16.64
	SD	69.03	130.55	196.65	429.95
	CV	154.35	585.53	1594.36	2583.33
VII	M	45.79	36.22	29.09	31.59
	SD	85.32	63.01	199.58	266.57
	CV	186.31	173.96	686.03	716.88
VIII	M	30.71	23.54	12.55	15.78
	SD	117.63	160.41	240.22	322.25
	CV	383.02	681.46	1914.23	2041.92
IX	M	33.83	25.31	21.36	23.26
	SD	39.75	31.14	78.61	158.42
	CV	117.48	123.03	368.07	681.10
X	M	45.14	46.38	51.16	49.91
	SD	99.99	178.40	313.20	276.33
	CV	221.52	384.66	612.20	754.08
XI	M	58.86	58.83	68.19	65.93
	SD	69.80	123.99	313.14	349.64
	CV	118.59	210.77	459.10	530.34
XII	M	75.50	46.74	8.29	19.90
	SD	182.70	190.56	277.85	513.19
	CV	242.00	407.69	3350.58	2579.12
CI	M	44.82	34.22	29.10	31.16
	SD	86.43	117.38	224.19	312.77
	CV	192.82	343.03	770.50	1003.79

*Number of farmers in sample.

Source: Adapted from N.L. Srivastava, "Transformation of Traditional Agriculture in Developing Countries: A Case Study of the Rupandehi district, a Ph.D. Thesis submitted to T.U. in 1983.