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Vol XXV
No. 4

ISSN 0019-5014

OCTOBER-
DECEMBER
1970

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

(3) There should be two pronged attacks on the problems of income distribution in the context of technological changes in agriculture. First, there should be a concerted effort to develop the kind of infra-structure needed to promote the technological changes on small farms. The measures in this direction would vary from area to area. Second, some action was needed in the area of agricultural taxation. Opinions were expressed that the high income-groups might be taxed to generate resources which could be utilized to promote the new technology among the weaker sections of farming communities. It was also indicated that some measures would be required to undertake the rural works programme and to avoid indiscriminate farm mechanization to increase employment opportunities in the rural areas. The Group recognized that some measures were being taken in the credit programme as well as in the small farmers development agency but a larger effort was needed and also the nature of this effort would have to take into account the diversity of situations.

SUBJECT III

DEVELOPMENT OF AGRICULTURE IN TRIBAL AREAS

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The session on the "Development of Agriculture in Tribal Areas" opened with a brief review of the characteristics of tribal agriculture and the factors that had influenced the development of tribal agriculture.

A. CHARACTERISTICS OF TRIBAL AGRICULTURE

(1) The dominant mode of agriculture in the hill areas is that of shifting cultivation.

(2) Under shifting cultivation, the length of the fallow is greater than the period over which cultivation takes place. The length of the fallow-break required to recoup the fertility of the soil is governed by soil conditions, the natural vegetation and the density of population which depends upon shifting cultivation. The length of the fallow, therefore, varies from area to area.

(3) After an area is selected for cultivation, the trees are felled and then burnt. This is followed by the spreading of ash on the soil.

(4) The main implements used are the axe and the digging stick.

(5) Some tribes broadcast the seeds while others make holes with the digging stick and then sow the seeds.

(6) Shifting cultivation gives rise to three major problems. Firstly, the yields under shifting cultivation are low, secondly, shifting cultivation leads to soil erosion and thirdly, it leads to the destruction of forests.

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B. FACTORS INFLUENCING TRIBAL AGRICULTURE

1. *Poor Communications*

The tribal areas are cut off from the outside world by poor means of communications. The isolation of the tribal areas has prevented the tribals from being exposed to new ideas and they are, therefore, extremely tradition bound and primitive in their approach. Even where conscious and deliberate attempts are made to place new ideas relating to agriculture before the tribals, it is again the absence of means of communication that prevents them from being receptive to them. This is because the new ideas in agriculture are directed towards an increase in the productivity of agriculture and an increase in productivity has a meaning only if the surplus agricultural produce can be marketed. Because the tribal areas are cut off by poor communication, the surplus agricultural produce will hardly be able to find its way to the market and therefore, there is no incentive to increase production beyond the local demand. Hence the effect of isolation on agriculture has been the continuance of primitive methods of agriculture.

2. *Lack of Irrigation Facilities*

The tribal areas lack irrigation facilities. This makes it difficult for the farmers to use the chemical fertilizers.

3. *Pattern of Land Ownership*

Individual ownership of land is recognized in certain areas but this is usually confined to the homestead and settled farm land. In most tribal areas, the land is owned by the community as a whole. For purposes of cultivation, however, the land is distributed to individual families by the village headman or council. This system of ownership does not create any attachment to the land that is cultivated and, therefore, there is no interest in the improvement of land for use in future.

4. *Supply of Agricultural Labour*

People work on their own fields but do not work for wages on the fields of others.

This brief review of the characteristics of tribal agriculture and the factors influencing tribal agriculture was followed by a discussion of the pre-conditions for the development of tribal agriculture.

PRE-CONDITIONS FOR DEVELOPMENT OF TRIBAL AGRICULTURE

1. *Education*

While the need for education was imperative, there were two difficulties relating to education:

- (a) It was necessary to impart education in the local language but it was found that the local language was generally not sufficiently developed to be used as a medium of instruction.

- (b) It was observed that even with a little bit of school education, the young tribals developed a distaste for agriculture and were only interested in looking for employment in urban areas. They were, however, technically not adequately equipped for jobs in urban areas and, therefore, they just found themselves without employment.

In view of the difficulties of education, it was suggested that a programme should be drawn up for functional education. It was necessary to make education, agriculture-and production-based. It was also considered important to build up local leaders in education.

2. *Communications*

A good system of communications linking the tribal areas with the outside world was considered essential for the development of agriculture. It was pointed out that the tribals themselves could be employed in the construction of roads. This would, during the construction phase, add to their income.

3. *Central Place Functions*

It was suggested that a central place should be developed for the supply of goods and services.

4. *Research in Suitable Varieties of Crops*

It was considered essential to evolve varieties of crops that would be specially suited to the conditions obtaining in tribal areas. The agricultural universities may consider the opening of special cells for conducting research into the crop needs of the tribal areas.

After the pre-conditions for development of agriculture, the Group considered in detail the various aspects and problems of tribal agriculture. The observations of the Group are briefly set out below.

A. SHIFTING CULTIVATION

1. *Forest Policy and Shifting Cultivation*

There is a conflict of interest between the forest authorities and the cultivators who practise shifting cultivation because the forest authorities want to prevent the felling of trees in order that they may preserve the forests whereas the cultivators find it essential to fell the trees in order to provide food for themselves. The forest authorities have placed restrictions on shifting cultivation but these restrictions vary from State to State.

These restrictions, however, have only a negative effect and, therefore, a number of positive measures have been suggested for controlling shifting cultivation: (1) The starting of nurseries for cash crops like cashewnut, black pepper, coffee and cardamom and distributing them to the local farmers. (2) The introduction of horticulture, pineapples, oranges, bard bananas can be grown. (3) The introduction of the *Taungia* system. (4) Introduction of terrace cultivation.

2. *Methods to Increase the Yields of Shifting Cultivation*

Since it is generally agreed that shifting cultivation will continue to be practised, it was considered necessary to examine the methods by which the yields from shifting cultivation could be increased. Some of the methods suggested for increasing the yields are : (i) Evolving of suitable varieties of paddy for shifting cultivation. (ii) Evolving a suitable mixture of crops. (iii) It is necessary to prevent fertilizers from being washed away; this could be done by (a) applying fertilizers to areas between rows of fruit cultivation, or (b) by digging holes along contour lines and then applying fertilizer. The cost of this method, however, is likely to be very high. (iv) Protecting the crops from elephants, rats and pests. (v) Strict supervision over weeding operations. And (vi) regulating the flow of water.

3. *Procedure for Estimating the Carrying Capacity of Land*

Two major assumptions are involved in the estimation of the carrying capacity of land : (i) the size or area of land required to support a person, (ii) the length of the fallow. Since the way these assumptions are made would exert considerable influence on the carrying capacity of land, it would be desirable to use the estimates of the carrying capacity of land with great caution.

B. SETTLED CULTIVATION

Settled cultivation implies the introduction of terrace cultivation. Terrace cultivation, however, is very expensive. Again, there is the question of what is the most appropriate agency for constructing and maintaining the terraces. There is also the problem that during the first two or three years, the yields under settled cultivation are lower than the yields under shifting cultivation; further there is an important part to play in shifting cultivation, they have a very insignificant role in settled cultivation.

Lessons from Colonisation Schemes

The weaknesses of the colonisation schemes have generally arisen from the following factors : (i) The land allotted to the tribals is of poor quality. (ii) The basic amenities are not available. (iii) Construction of the houses is not suitable for the social and cultural needs of the tribals. (iv) When tribals are brought together from different areas, their manners and customs are incompatible. (v) A certain minimum number need to be brought together from a tribe so that they can follow their social and religious customs. (vi) After moving on to the colonies, the tribals lacked the means to support themselves till the next crop was raised.

C. PATTERN OF LAND OWNERSHIP

Generally, the community system of ownership of land was considered appropriate for shifting cultivation. For settled cultivation, two divergent points of view were expressed. One view was that the land should be allotted to indi-

viduals as this would create an interest in the development of land while the other view was that individual ownership from the long-term point of view would lead to sub-division and fragmentation and, therefore, community ownership or co-operative ownership was preferable.

D. CO-OPERATIVES

It was suggested that an evaluation study on the working of co-operatives in the tribal areas was necessary before a view could be taken about the organization of co-operatives for tribals.

E. DEVELOPMENT OF SUBSIDIARY INDUSTRIES

It would be desirable to develop dairy farming and poultry farming as subsidiary industries. There is also scope for developing bee-keeping and rearing of silk worms. The tribal women are very good at weaving and therefore there is tremendous scope for developing the handloom industry.

F. EXTENSION PERSONNEL

It was observed that the special nature of extension work in tribal areas needed to be carefully studied. Special care should be taken for the selection of extension personnel, and suitable arrangements made for their training.