SOCIO-ECONOMIC RESEARCH ON CROPPING SYSTEMS PROGRAM IN NEPAL

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Introduction

The Cropping Systems Program in Nepal was started in early 1977 with the aim of increasing total production and improving farmers' welfare by (a) multiple cropping and (b) increasing yields of each crop in the pattern. This program, attached with the Agronomy Division under the Department of Agriculture (Appendix I), is one of the components of the Integrated Cereals Project (ICP). It is being carried out in five sites in Nepal namely: (1) Pumdi Bhumdi near Pokhara in Kaski District in the Western Hill Region; (2) Lele in Lalitpur District in the Kathmandu Valley; (3) Chauri Jahari in Rukum District in the Far Western Hill Region; (4) Khanbari in Sankhuwa Sabha District in the Eastern Hill Region and (5) Langari, Dhobini, Sukchaina and Lipani Birta villages in Parsa District in the Terai (the plains). Economists and an anthropologist joined the program in early 1978.

The First Survey

The first step taken by the socio-economic group was the key informant interviews. In the key informant survey*, two knowledgeable farmers were interviewed from each ward of the panchayat** where cropping systems research is being carried out. The Pradhan Panchas (the Head of the Panchayat) were also interviewed about their Panchayats. Merchants and employees of Agricultural Development Bank, Cooperative and Agricultural Input Corporation were also interviewed. Overall, an average of twelve farmers and one Pradhan Panch were interviewed at each site. In this way a large amount of data were collected by spending about a week at each

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* For details Mathema, S.B. and Van Der Veen M.G. (1978 - "Socio-economic Research on Farming Systems in Nepal: A Key Informant Survey in Five Cropping Systems Research Sites" CSP, Tech. Report I, Department of Agriculture, Nepal.

** Panchayat is the administrative unit at the lowest level (village) in the four-tier Panchayat System in Nepal.

site. The main findings of this survey are listed below and they are used to identify subjects or problems requiring additional research.

1. The size of farms in Nepal are generally very small, the amount of land and capital owned is limited, but these resources are intensively utilized in a complex farming system composed of a number of interrelated enterprises.

2. The mixture of upland and lowland land types found on most farms allows a diversity of cropping patterns to be grown. These differences allow: the more even distribution of labor and power requirements over the year, some degree of risk aversion and a variety of food for household consumption. This diversity suggests that a new cropping pattern would be adopted on only a part of the cultivated area of the farm.

3. The livestock enterprise is important at all sites. They provide cash income, high quality food, a source of security, drought power and dung for compost. However they are dependent upon plant residue and to some extent grains for feed and a large amoung of labor for their care.

4. Shortages of labor and bullock power already appear duing certain times of the year leading to untimely and/or poor production practices and possibly to substantial reductions in yield.

5. The lack of plant nutrients is an important constraint for more intensive cultivation or for higher yields on most of the cropping systems sites.

6. The farmers are very subsistence oriented in crop production. Very little of what is produced is sold and a large part of what produced is used for consumption by the farmers' household and

7. There are periods of the year when land and labor are not fully utilized and there may be considerable scope for improving performance of the farming systems.

8. Considerable variability among farmers at each site exists as to farm size, available capital, and available labor. The goals and strategies of individual farmers may differ in systematic ways.

9. There are important differences from CS site to CS site in cropping systems, in agronomic characteristics, and in land, labor, animal and capital resources.

These findings indicate that farmers make choices in how they utilize the land, labor and capital at their disposal. According to a farmer's knowledge and experience, the resources available to him and the constrains under which he must operate, a farmer engages in a number

of enterprises to fulfill his needs for production and also for security. Because of the diversity and the inner relatedness of these enterprises, judgements of the suitability of a new cropping pattern must be based not only on increased yield of the new pattern but also on its relationship to other farm enterprises. The land, capital and labor requirements of the new pattern must be evaluate against other farm activities. In addition, since most of the agricultural production at cropping systems sites is used for subsistence, performance of a new cropping pattern must be judged, in part, by the value placed on the farm product by the farmer and not merely on the market value of the crop. Farm preference for a certain food or crop varieties and farmer beliefs concerning his cropping system may influence his decision to adopt or reject a new pattern.

Initial studies suggest that although there may be some limited scope for improving production by more efficient allocation of farmer resources, the most significant gains will probably come from the adoption of new and improved crops and crop varieties (which allow higher yields or more intensive cropping), from improved livestock management, and from the use of chemical fertilizer and pesticide inputs in selected areas. Cropping systems field trials are attempting to indicate the most promising of possible technological changes. The socio-economic research group will evaluate the economic potential of these possible technological improvements and will identify the economic, social and cultural constraints that might limit adoption.

Goals

The work plan of socio-economic group is oriented towards:

1. Describing existing farming systems at cropping systems sites.

2. Evaluating the performance of the components of the

3. Identifying the scope and means for the improvement of farming system.

4. Assessing farmers' goals and preferences and the socio-psychological factors influencing adoption of improved practices.

5. Studying the marketing and credit constraints to adoption and

6. Developing rational farm plans for improvement of farmers' systems.

Studies performed under this plan will:

a. Provide primary data useful for policy formulation.

b. Assist in the identification of probable cropping systems improvements.

c. Facilitate the adoption of cropping systems innovations.

Research Topics for Study

On the basis of above findings the socio-economic group is focussing on a number of relatively narrowly defined subject or problem areas. The following is a list of research topics for study and their description. Some of them are underway.

1. Economics of Crop Production

Objectives:

a. Cash costs, total variable costs, gross returns, net returns, per hour of labor input, benefit-cost ratios etc. for each of the major crops grown on farmers' fields in each site will be calculated and compared.

b. The quantity and quality of crop residue for fodder will also be measured.

Source of Data:

The required data are collected by farmers' interviews and crop cuttings combined with information from labor and bullock requirements for crop production and analysis of fodder composition.

Results:

Thirty to fifty farmers of different farm size are monitored at each site by the socio-economic recorders. The inputs used for each crop, labor and power requirements for each different operations are recorded. Crop cuttings are carried out in the monitored farm with the help of socio-economic staffs and the site staffs. At present, the data on the economics of wheat crop were collected at the sites and they are in the process for analysis. Farmers at each sites will be monitored for all the main crops grown.

2. Organization of labor and power supply

Objectives:

a. Explain how farmers' cooperate and organize to get the work done;

b. Assess the flexibility and efficiency of the system and the scope for improvement;

c. Measure the extent and timing of off farm employment.

d. Evaluate the seriousness of the labor and power shortage problems during peak periods.

e. Provide implications which the situation may have cropping patterns potentially to be introduced.

Source of Data:

Farmers' interview.

Results:

A preliminary survey was conducted to study labor organization at Pumdi Bhumdi site. The labor organization in this site is based on a system called "Pareli System". The first draft of the findings is written up.

3. Labor and bullock requirements for crop production

Objectives:

a. Record the timing and amount (by type) of labor and bullock power used in farmers' fields on each major crop grown; on each land type, at each cropping systems site.

b. Calculate a standard (or mean) labor and power requirement for each crop for use in cost of production studies.

Source of Data:

Farmers' interviews combined with observation.

Results:

Data on labor and bullock requirements for wheat at Pumdi Bhumdi and Parsa sites are available. They are analyzed for standardizing the labor and bullock requirements for each different operations.

4. Cropping Systems

Objectives:

a. Describe the cropping systems followed by the farmers at each site.

b. Calculate the flow of inputs and outputs in crop production on farm throughout the year and

c. Try to develop some understanding why certain cropping patterns are followed under different conditions.

Source of Data:

Farmers' interviews combined with information as cited above.

Results:

The data of three sites from the cropping systems interview are being processed and the survey is being carried out in two more sites. The results from one of the site namely Dhobini Panchayat, Parsa District indicates that a large amount of scope exists for increased crop production by making fuller utilization of land during the year and by increasing yields of individual crops. The constraints for multiple cropping and for higher yields are similar, namely: (1) a deficiency of plant nutrients in the soil; (2) poor water control leading either to flooding in the winter or to water shortages throughout the year, and (3) power and labor shortages. At present, results of cropping systems survey are ready for three sites and a first draft write up of some of the main findings of the study are available.

5. Economics of livestock production

Objectives:

a. Analyze the costs and benefits of owning each common type of livestock at multiple cropping sites.

b. Explain the buying and selling practices followed.

c. Measure the amount, type and timing of labor used for animal care.

d. Analyze interrelationships (and competition) with the cropping system and

e. Assess the scope for improvements.

Source of Data:

Literature review, consultations with the Animal Science Division and farmers' interview.

6. Soil Fertility

Objectives:

a. Estimate the amount of nutrients supplied to fields through compost,

b. Calculate the amount of nutrient requirements for various crops or patterns;

c. Assess the scope for increasing the amount of nutrients supplied through compost and estimate the requirements in terms of labor etc. for the increased supply and

d. Evaluate the relative cost effectiveness in multiple cropping sites of extra nutrients from compost Vs the use of chemical fertilizer.

Source of Data:

Secondary data, analysis of compost samples, data collected above on: livestock number, feed fed, land area etc; field trials, demonstration and testing of recommended compost making practices and farmers' interviews.

7. Adjustment to risk

Objectives:

To develop an understanding of the various means the farmers use to reduce risk and to manage the loss from risk.

Source of Data

Information collected above on farming and from interviews.

8. Socio-psychological characteristics of rural families

Objectives:

a. Identify important socio-psychological characteristics of the farmers and analyze how these characteristics affect cropping patterns, the control of irrigation water and the control of grazing of pasture and fallow lands.

b. Determine the relative ranking of goals or preferences farmers have for various improvements in the farming system and

c. Identify socio-psychological factors affecting the attainment of these goals.

Source of Data:

Formal and informal interviewing, non participant observation.

9. Farmer variety preference

Objectives:

Understand the factors influencing farmers' decisions to plant particular crop varieties.

Source of Data:

Formal and informal farmers' interviews, non participant observation, crop cuttings.

Results:

A study on "Farmer's Preferences for Local Rice Varieties" was carried out by the anthoroplogist* of the Cropping Systems Program at Pumdi Bhumdi site. The results derived from this study will contribute to the understanding of the cropping systems of the area.

10. Agricultural credit and input availability

Objectives:

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* R.F. Schroeder (1978): "Farmer's Preference for Local Rice Varieties", Cropping Systems Program, Pumdi Bhumdi, Nepal (Unpublished).

Determine:

1. How well local credit and agricultural input supply institutions meet the needs of small farmers and

2. The scope or plans for increasing the services rendered.

Source of Data:

Collected from visits to officials working in the input supply and credit institutions on the local and national level and from farmers' interview.

11. Product marketing and barter practices

Objectives:

a. Describe common buying, selling, storage and exchange practices followed.

b. Record prices paid and received and their fluctuations overtime.

c. Record exchange rates between commodities and try to understand how they are determined.

Source of Data:

Farmer and merchant interviews, secondary data from different sources.

12. Evaluation of cropping patterns trials

Objectives:

a. To compare farmers' existing cropping patterns with the farmers' improved cropping patterns.

b. To determine benefits from farmers' improved cropping patterns in relation to existing patterns.

Source of Data:

Cropping pattern trials conducted at all sites and socio-economic data collected by observation and farmer interview.

Results:

The results for all sites for 1977-79 are published.

13. Case studies

a. Four farmers are to be selected at each of the five cropping systems sites. Farmers will be choosen to represent typical farms in the area according to farm and household size and animal number. The farmer or a member of his household must be literate and willing to record data daily.

b. Farmer or household member will record data daily and be visited by socio-economic team member at least twice a week.

c. A small in kind incentive will be provided.

d. Data:

1. In initial interview and visit to farmer's fields basic socio-economic and cropping systems data will be collected.

2. Data will be recorded daily on:

a) activities of household members,

b) farm production,

c) disposition of farm production,

d) agricultural inputs used in each of farmers' fields,

e) activities and whereabouts of farm animals,

f) grain, salt, feed fed to animals.

3. Periodic data will be collected on:

a) crop cuttings as crops mature,

b) milk, meat, and egg production,

c) measurement of actual food consumption..

4. Topical interviews will be conducted when appropriate.

e. Cropping systems research may be carried out on the farmer's fields so long as it does not significantly interfere with the farmer's normal activities. After completion of case studies, cooperating farmers may be excellent subjects for the introduction and monitoring of new cropping patterns.

Future Work Plan

The work of the socio-economic group has been and continues to be to develop a greater understanding of farm families and how (how well) they relate to their physical, social and economic environments. The efforts so far have mainly been devoted to the Cropping Systems Program itself, which initially is working at five sites in Nepal.

The work of the socio-economic group in the future will be directed towards:

1. Continuing work at the present cropping systems sites;

2. Extending the socio-economic work on cropping systems at other cropping systems sites as they are selected;

3. Helping in the extension of the findings of cropping systems research to other areas of Nepal;

4. Providing economic analysis input into the commodity programs; and

5. Analyzing the economic benefits to the farmers at cropping systems sites of the cropping systems program.

Appendix I. Organization Chart.