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ABSTRACTS OF Ph.D. THESES

Kumar, Parvendra. 1992. "Role of Women in Agricultural Production and Income in Bijnor District of Western U.P." Agra University (B.V. Rural Institute), Agra. *Major Advisor* : P.K. Sharma.

Keeping in view the important contribution, both on-farm and off-farm, of rural women, the present study on the role of women in agricultural production and income generation was taken up in Bijnor District of U.P. The objectives of the study were to determine the extent of decision making and participation of women in different types of on-farm and off-farm activities, the share of female labour earnings in the total household income, the extent of female involvement in adoption of modern agricultural technology and to identify activities in which rural women can participate in addition to those in which they are already participating. Multi-stage stratified random sampling technique was used to select the households. The final sample comprised 250 households representing landless, small, medium and large categories in proportion to the number of total such households in each village. This micro-level investigation is based on cross sectional data relating to the year 1989-90.

The analysis of data pertaining to general features of the sample households revealed that the overall size of family was 8 persons per household, out of which about 54% were male and 46% female, making a sex ratio of 839 females per 1000 males. Further, in terms of the level of education, large households were found to form the educated group. It was also observed that the number of farm working women decreased with increase in farm size.

In the existing cropping pattern, sugarcane was found to be main crop in the study area, accounting for 40% of the total cropped area and generating about 227 mandays of employment per farm. Female labour belonging to land less category played a vital role in sugarcane cultivation performing more than half (54.15%) the work done. It was also observed that cleaning of sugarcane registered highest female labour utilisation (62.23%), followed by weeding and harvesting.

As regards the participation of farm women in decision making in on-farm and off-farm activities it was observed that selection of crops, weed control, hiring the labour for different farm operations were the

on-farm activities and storage of farm produce, selection of milch animals, milk marketing and family expenditure were the important off-farm activities in which females of the household participated to a great extent. However, the participation of women in various types of organisations was very poor, and 92% women never participated in any such organisations.

The study further revealed that crop enterprise was the major source of household income followed by cattle keeping. They accounted for about 61% and 16% total household income, respectively. The contribution of women in these enterprises has been worked out to be about 18% and 47%, respectively. However, as the farm size increased the share of females decreases.

Mahaboob Shareef, S. 1989. Water and its Optimization at Farm and Regional Level in K.C. Canal Irrigation System in Andhra Pradesh. Tamil Nadu Agricultural University, Coimbatore. *Major Advisor* : S. Krishnamoorthy.

The study was undertaken in the Santajatur-Rajoli Anicut reach in the K.C. Canal irrigation system in Andhra Pradesh. The specific objectives of the research were to study the pattern of water use, examine the productivity of water at different regions, develop optimum plans at farm and regional levels for optimal use of available water and other resources and suggest policy measures for efficient use. The length of the reach was divided into three regions viz. Head, Middle and Tail based on the distance from the off-take point. From each region, one distributory was selected and in each distributory 40 farms were selected at random, thus totalling to a sample size of 120. The selected farms were again post-stratified according to location and size of the farm from the outlet of supply channel. The collected data were processed and subjected to average and percentage analysis. Secondly, production functions were estimated to analyse the pattern of resource use efficiency. And, thirdly, optimum plans were developed at farm and regional level through the use of linear programming technique for maximization of income.

The farm level water use depended upon the water availability which in turn influenced the nature of crops grown. The distance-wise analysis in wet season showed that wet crops occupied major area in all the distance categories of Head, Middle and Tail regions.

Below one kilometer distance, the percentage of irrigated area was

highest but low percentage of irrigated area was observed in the farthest distance category. Reverse relation was observed with regard to fallow area. The number of wells was highest in Tail region particularly in the irrigation distance category of 2.01—3.00 km and 3.01 km and above in all the regions. The percentage contribution by canal source was highest for the wet crops in the Head region, while the percentage contribution by canal+well source was highest for the irrigated dry crops in Tail region. The distribution of wells was highest in the third size category (2.01 ha and above) followed by second (1.01-2.00 ha) and first (0-1.0 ha) and with the increase in farm size more number of wells were noted.

The distance and size wise input use showed that farmers who had canal+well irrigation applied more NPK fertilizers for paddy, groundnut, cotton and sugarcane than the recommended level in all the regions. Similarly in all the distance categories and in all the regions and all size group farmers with canal+well irrigation obtained higher yield above 2000 kg in the case of groundnut and cotton, above 100 tonnes in sugarcane and above 5000 kg in paddy crop.

The coefficient of variation of water use for the surveyed canal irrigated farms was higher in Tail region followed by Middle and Head region. The same trend was noticed in canal+well irrigated farms. The water use was highest in farms located nearer to the starting point of supply channel but lowest at the Tail point of supply channel in all the regions for both canal as well as canal+well irrigated farms, for all the crops.

The production function revealed that there exists potentialities for maximizing the level of output through resource allocation. The MVP of fertilizer was favourable for cotton and sugarcane in all the three regions. The MVP of water was found favourable particularly in Tail regions in all the crops. The labour and management input also influenced the crop output in Head and Middle region.

Optimization exercise at farms and regional level revealed that there exists potential for increasing income under existing resource level and technology. The sensitivity analysis with the reduction in availability of water by 10, 20 and 30 per cent also revealed that the income could be increased even under the reduced water supply conditions.

Kumar, Krishan. 1991. Economic Analysis of Tribal Agriculture in Lahaul Valley of Himachal Pradesh. Himachal Pradesh Krishi Vishvavidyalaya, Palampur. *Major Advisor* : T.V. Moorti.

Tribal area in Himachal Pradesh constitutes about 42 per cent of the total geographical area of the state. Agriculture is the main occupation for income and employment. Cash crops like potato, *kuth* are cultivated in these areas. The present study was carried in Lahaul tribal area of Himachal Pradesh. The specific objectives were to study the existing resource allocation alongwith their productivities, resource-use efficiency and returns to scale on important crops, extent and nature of adoption of few agricultural practices and finally to identify the economic constraints in the development of tribal agriculture.

Lahaul Valley of district Lahaul and Spiti in Himachal Pradesh was purposively selected. A two-stage stratified random sampling design was adopted to select the sample households. Cumulative cube-root frequency method was adopted to develop small, medium and large farm situations. A random sample of 150 households was selected through proportional-allocation method. Tabular analysis, regression analysis, Gini-concentration ratios and tobit analysis were employed for different objectives.

The main occupation of the sampled households was agriculture. The average holding size was 1.86 hectares. The cropping pattern was dominated by potato. The other important crops of the area were barley, pea, wheat and *rajmah*. Single season cultivation was observed due to snow in winter. The cropping intensity was found to be about 103 per cent. The crop productivity in the study area was higher than the state average. The net returns per hectare were higher for potato, *kuth* and pea. The inequalities in total household income, farm income and off-farm income were higher on large farms. Increasing returns to scale were found for potato and pea. It was found that for the farm as a whole, the pattern of investment should be on human labour followed by plant protection measures and fertilizers and manures. The tobit analysis indicated about 86 per cent probability of fertilizer adoption. The expected adoption rate was found to be positively related with farm size. The different production problems were found to be non-availability and untimely supply of inputs, scarcity of human labour during peak periods and inadequate extension services. The marketing problems highlighted were low output price in the local market particularly in pea, lack of transportation facilities and delayed payments. On the basis of the study, it was suggested to provide marketing facilities for *kuth* since net-returns from this crop were higher. The study area remains closed from

November to April-May. So different inputs should be supplied during October-November. Potato Co-operative society should be involved for the sale of pea. Efforts should be made to give immediate payments to farmers since they have to purchase consumer goods in bulk. For this credit facilities may be provided. Lastly, it was suggested to strengthen the agricultural extension services and to train the progressive farmers of the village for extension service.

Bala, Brij. 1992. Role of Women in Agriculture : A Study of Kangra Farms, Himachal Pradesh. Himachal Pradesh Krishi Vishva-vidyalaya, Palampur. *Major Advisor* : T.V. Moorti.

The female labour participation in hill agriculture is very important because of its participation in various operations. To highlight the role of women in various fields the present investigation has been taken up in Himachal Pradesh with the four objectives viz.,

- (i) To study the magnitude of participation of women labour in various field operations and other supportive activities in agricultural production,
- (ii) to evaluate the production of income generated through women labour in different farm-enterprises,
- (iii) to compare labour efficiency of men and women and to examine the possibility of substitution for different farm-enterprises and
- (iv) to study various socio-economic problems and constraints of women-folk in the decision-making process and participation of various activities on the farm.

Three stage random sampling was adopted to select blocks villages and farm households. To achieve the first and fourth objective tabular analysis was employed. The other two objectives were fulfilled by fitting production function.

It was observed that more than 90 per cent of the total human labour required on the farm was contributed by family labour of which 53 per cent was the share of female labour. Female labour contributed more than male labour in case of paddy, maize and vegetable crop. The operations like cold breaking, manuring, transplanting, weeding, hoeing and post-harvest operations were performed predominantly by female labour. About 60 per cent of the total labour in livestock was shared by female. They spent maximum proportion of their working time on household chores (58 per cent) followed by farm-sector. The participation of women in usual labour force was found to be affected positively

by the cultivated area, number of women in the household, number of children in 5-14 years of age-group, number of women with above primary education, employment of male members in public works and negatively by the number of men currently in labour force and number of babies. The current labour force participation for women was found to be directly influenced by their employment in non-farm family enterprises and regular wage works as well as by the employment of male member in public works, The number of male earners, school going children and babies in the household showed negative response. The number of person-days hired-out/reported unemployed for women was affected positively by the number of adult women currently in labour force and caste factor and that for men was dependent on the number of male members currently in labour and the number of dependents in the household. The log-linear production functions showed that the elasticity coefficients for female labour were less than that for male labour in all the cases except paddy and livestock. The returns to scale (Σb_i) were found to be increasing for all the enterprises. It was further observed that the maximum proportion of the income from all the enterprises was generated through capital input followed by fertilizers and manure. The share of female input was less than that of male labour in all the farm enterprises except paddy. The share of female labour in income from the farm as a whole was 17 per cent and that from livestock was 26 per cent. The female labour performed efficiently in case of paddy and wheat than on maize and potato respectively, whereas the male labour was found efficient on maize crop than on paddy and was equally efficient for wheat and potato.

Sharma, Ashwani Kumar. 1990. An Economic Analysis of Different Sources of Irrigation in Kangra District of Himachal Pradesh. Himachal Pradesh Krishi Vishvavidyalaya, Palampur. *Major Advisor* : T.V. Moorti.

Kangra District of Himachal Pradesh is predominantly served by by minor irrigation sources viz: *Khul*, Tube-well, lift irrigation. The traditional way of water charging from these sources on the basis of area under irrigation has not provided any incentive for the economic and optimum use of water which now needs to be ensured by suitably charging and by following suitable cropproduction strategies under each source of irrigation.

The study was undertaken with the following specific objectives :

1. To examine the costs and pattern of water use under different source of irrigation, 2. to examine the existing land use pattern, crop

yields and farm business income under different sources of irrigation, 3, to study the input-output relationship under different sources of irrigation, 4, to evolve suitable cropping strategies under different-sources of irrigation for maximising the farm profits and, 5, to identify various socio-economic problems of the farmers operating under different sources of irrigation and suggest measures for efficient water use.

The study was carried out in Kangra district of Himachal Pradesh. Double stratified two-stage random sampling technique was employed to select the sample households with irrigated villages as stage-I units and household as Stage-II units. A random sample of 160 households was selected with probability proportional to the number of farmers under different sizes of holdings. The data collected pertained to the year 1987-88. Tabular analysis, regression analysis and linear programming was employed to meet out the requirements of different objectives. Bllaney and Criddle procedure was employed for estimating the water requirements with the help of climatological data.

The study brought out that the water was found to be deficit during May, June and November under all sources of irrigation which coincided with the critical periods of crop growth. The *Kuhl* were found to be without storage capacity and there was high degree of correspondence between the rainfall and the amount of water available in the *Kuhl*. *Kuhl* was found to be the cheapest source of irrigation (Rs. 6.67 per 1000 cubic metre of water) among the three sources of irrigation. The water from state tube-wells and Lift Irrigation Scheme was about 35 times and 38 times costlier respectively than that from *Kuhls*. The water distribution pattern on *Kuhl* irrigated fields was very problematic. Complex local arrangement in the form of irrigation rights were found to exist for basic task of water distribution during *Kharif* season in which some fields that had been sown with paddy, needed a continuous supply of water while the unsown fields were supplied water on rotational basis. After one month of paddy sowing i.e. during the time of *Hod* operations, there occurred a significant reconfiguration in most of the *Kuhls* and water distribution among and within the villages was found to exist on quasi-proportional basis. Farm business income increased with the creation of irrigation structures like tube-well and lift irrigation. One rupee worth of investment generated Rs. 1.47 as income on overall tube-well farms. The tube-well irrigation was found to be factor biased. On *Kuhl* irrigated farms decreasing returns to scale were found to exist with the improvement in the technique of paddy cultivation. For wheat crop, constant returns to scale were found to operate under all the sources of

irrigation. On tube-well and lift irrigated farms the availability of less irrigation water was the main factor responsible for the sub-optimal utilisation of the market oriented inputs like fertilizers. The optimal cropping pattern under all the sources of irrigation indicated a trend towards commercial cultivation. An increase in the resource use and consequently in farm income was observed under optimised plans which could further be increased in the wake of modern technology. It was also observed that the farmers in the middle and lower reaches of the *Kuhl* network received the poorest irrigation facilities and paid the heaviest resource burden for maintenance and repairs. The study, therefore, suggests that irrigation rights of villages using *Kuhl* irrigation should be re-constituted and *Kuhls* should be provided with storage capacity.