Vol XL
No. 3

ISSN 0019-5014

CONFERENCE
NUMBER

JULY-
SEPTEMBER
1985

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

SUMMARIES

VEGETABLE PRODUCTION FOR DIVERSIFICATION OF FARM ECONOMY

D.S. Thakur, Kapila and T.V. Moorti*

This study has been conducted in Saproon Valley of district Solan in Himachal Pradesh which is famous for its quality vegetables and vegetable seeds production throughout the country. It attempts to estimate the income from vegetable cultivation vis-a-vis other field crops as also to study the credit requirements of the vegetable growers. The study emphasizes that diversification towards intensive vegetable cultivation can enable farmers to get yields which are ten times higher than cereal crops per unit of land. As the price of vegetables also remains higher than that of cereals, diversification of farming with vegetable production helps even the small farmers to earn sufficient income to make their livelihood.

The study shows that a gross income of more than Rs. 1,15,000 per hectare (ha.) and a net income of about Rs. 70,000 to Rs. 90,000 per ha. per year can be obtained by producing cauliflower seeds or two crops of tomatoes in this Valley. The vegetable growers have adopted the recommended package of practices in totality in order to obtain record production and income. The credit requirement of marginal, small, medium and large growers for the adoption of the optimum cropping plan worked out to Rs. 1,548, Rs. 2,500, Rs. 3,615 and Rs. 12,906 respectively. Besides, they are desirous of getting credit for the purchase of livestock, consumption goods, cars, trucks and other means of transport which altogether amounted to Rs. 11,775 for marginal, Rs. 24,067 for small, Rs. 52,846 for medium and Rs. 1,16,789 for large farmers. It is concluded that the farmers can earn very high income annually by diversification towards vegetable growing. In view of this there is a need for provision of more credit which can be pumped in different vegetable producing areas by the banks. Besides, the government and co-operatives should come forward to establish vegetable processing factory in the Valley and to help in the organized marketing of raw and processed vegetables, both in the internal markets and for exports.

DIVERSIFICATION OF FARMING WITH CROP CULTIVATION AND DAIRYING IN PUNJAB–AN APPRAISAL OF SUCCESS AND CONSTRAINTS

Bant Singh, H.S. Bal and Narinder Kumar†

To increase and regulate the income from farming, adoption of dairy farming along with crop cultivation is being encouraged under various development plans. However, the progress in the expansion of dairy farming, particularly in the rural areas has not been encouraging. The present study was conducted to examine the reasons for its slow development and its present status in Punjab. The major objectives of the study were: *(i)* to examine the characteristics and privileges of the farm households adopting dairy enterprise; *(ii)* to work out the economics of dairy farming versus crop cultivation; and *(iii)* to study the constraints in the development/expansion of dairy farming in the rural areas of the State. The study is based on 40 farm households selected through multiple random sampling technique from

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four villages,*i.e.*, two sub-urban and two rural, from Ludhiana and Samrala development blocks of Ludhiana district and pertains to the year 1983-84.

The study brought out that nearly 46 per cent farm families in the sub-urban and 32 per cent in the rural villages sold milk. Nearly 50 per cent of the families selling milk in both the sub-urban and rural villages sold milk regularly whereas the other 50 per cent sold milk occasionally/seasonally. The proportion of families selling milk regularly was higher in group I (farm households with land holdings above five acres) than in group II (farm households with land holdings of five acres and below) in both the sub-urban and rural households. Around 67 per cent of the families selling milk in the sub-urban and 60 per cent in the rural villages reported that dairy farming is profitable over crop farming. The remaining households held the opposite view. Among the factors influencing the adoption/expansion of dairy enterprise, *(i)* educational level of the head of the family, *(ii)* number of adult workers in the family, *(iii)* extent of non-farm income to the family, *(iv)* distance of the farmer's field from his residence; *(v)* availability of irrigation water to grow fodder, and *(vi)* adequate space and capital were examined. Although the former two factors did not exhibit any relation with the adoption of dairy enterprise, these had positive and significant relationship with the scale (expansion) of the dairy enterprise. Factors *(iii)* and *(iv)* had negative influence while factors *(v)* and *(vi)* had positive influence on the adoption of dairy enterprise. The contribution of dairy enterprise to total farm income (returns to fixed farm resources) was estimated to be 32.58 and 46.27 per cent in group I and group II farm households in the sub-urban and 19.51 and 32.63 per cent in the rural villages respectively. With the adoption of dairy farming alongwith crop cultivation, the farm incomes of group I and group II households have increased by 22.44 and 34.47 per cent in the sub-urban and by 6.77 and 16.24 per cent in the rural villages respectively. Dairy farming on per unit area basis is more profitable than crop farming. It promises an average return of Rs. 4,792.64 and Rs. 4,638.36 per acre in group I and group II households in the sub-urban and Rs. 2,305.96 and Rs. 2,289.96 in the rural villages respectively. The corresponding income from crop cultivation worked out to be Rs. 2,096.58 and Rs. 2,073.69 in the sub-urban and Rs. 1,556.41 and Rs. 1,309.79 in the rural villages respectively. The major constraints in the development/expansion of dairy farming were identified to be *(i)* imperfect market for milk, *(ii)* low price of milk, *(iii)* high cost of concentrates, *(iv)* perishable and seasonal nature of milk, *(v)* high price of milch animals, *(vi)* high risks to the milch animals, and *(vii)* shortage of adequate space and capital on many farms.

POTENTIAL FOR INCREASING FARM INCOME IN DRY FARMING AREAS THROUGH DIVERSIFICATION

S.B. Dangat and R.G. Patil*

A study was undertaken to estimate the potential for increasing farm income through diversification in Ahmednagar district in Maharashtra, which is predominantly a drought-prone area. A sample of 138 holdings from 23 sample villages covering *kharif* and *rabi* zones of the district was selected. The data for the year 1981-82 were collected by survey method. Linear programming technique was used for obtaining optimal farm plans – one with the existing constraints and another by removing the constraint of capital. There was increase in the gross area in the optimal plan without capital constraint over that in the existing plan in all the size-groups in both the zones. It was observed that the improved varieties of crops replaced the local varieties. Similarly, the cross-bred cows substituted the

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local cows. In order to feed these milch animals, lucerne substituted sugarcane. It was observed that the per farm as well as per hectare gross income increased substantially in the optimal plans as compared to that in the existing plans in all the three size-groups in both the zones. The increase was more in the optimal plan without capital constraint (plan II) as compared to that of the capital constraint plan (plan I), indicating that the availability of capital resulted in increased gross income. The increase in the gross income in plan I over the existing plan was 36, 57 and 33 per cent respectively, in small, medium and large size-groups of *kharif* zone. The percentage increase in plan II in the above size-groups was 89, 103 and 105 respectively. As regards *rabi* zone, the increase in the gross income in plan I over that in the existing plan was 12, 83 and 52 per cent in small, medium and large size-groups respectively. With the unlimited amount of capital, the increase in the gross income was to the extent of 116, 208 and 110 per cent in small, medium and large size-groups respectively.

The increase in the income over variable costs was also worked out. The average per farm as well as per hectare income over variable costs also increased in the optimal plans in all the three size-groups in both the zones. However, the gross income had shown a much higher rate of rise than the income over variable costs. This might be due to the demand of more monetary inputs in the alternate plan as compared to that in the existing plan, which demands for the provision of credit to meet the additional expenses required for adoption of diversification.

AN ANALYSIS OF A MODEL FOR DIVERSIFICATION OF RURAL ECONOMY OF PUNJAB

I.S. Chatha and Joginder Singh*

For the rural economy in general and landless and small farmers in particular, the diversification of farm and non-farm enterprises has been largely considered to provide the hope for their economic uplift. Under the 'Lab to Land Project' which was introduced in 1979-80 to improve the economic lot of landless rural poor and marginal and small farmers, a model of diversification was tried by a team of the Department of Animal Science, Punjab Agricultural University, Ludhiana. The paper attempts to examine this diversification model, the first phase of which was completed in 1983-84. A sample of 50 farmers was selected out of 322 families covered by the team.

To meet the objective of diversification, liberal loans were arranged by the team through various agencies for raising capital intensive enterprises like dairy and poultry. Assistance was also given in terms of critical inputs like feed, fodder, seed, fertilizers, etc. Apart from this, the concerned families were also imparted training in their respective enterprises and the technical guidance by the team was also provided from time to time in raising new enterprises. Two co-operative societies were organized for marketing of inputs and output efficiently.

Before the start of the project, 21 families were dependent upon single enterprise like crop farming, casual labour and permanent labour, 22 families were dependent on a combination of two enterprises including dairy and the rest 7 families on more than two such enterprise combinations. At the end of the project 4, 21 and 25 respondents were dependent on single enterprise, a combination of two enterprises and a combination of more than two enterprises respectively. This shows that there was considerable shift from one enterprise to more than one. Dairy, poultry, service and transport were the ventures undertaken during the project.

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A significant feature of the professional shift was that employment in permanent labour was reduced considerably (10 to 1). This implies that diversification provided ample self-employment opportunities to the rural poor which was a healthy sign.

There was an increase in income of the order of 112 and 66 per cent per family and per worker respectively at current prices. The respective increases were 42 and 12 per cent at constant prices. The income per family was also estimated without the help of the project. It was revealed that there was an increase of about 64 per cent in family income as a result of diversification only. The enhanced income was mainly invested in house construction and in social ceremonies. The loan component played an important role in bringing about diversification of capital intensive enterprises like dairy and poultry. However, the repayment of loan by the majority of the respondents was being made without much difficulty. The effort of the team in the formation of co-operative marketing societies to solve the input and output marketing problems has been very helpful which in itself helped in enhancing the diversification of the rural economy. Besides,these co-operative societies are expected to yield much more social and economic returns over a longer period.

EFFECT OF DIVERSIFIED FARMING ON INCOME AND EMPLOYMENT

G. Madhava Swamy†

A study was conducted with the object of assessing the impact on additional income and employment potential due to inclusion of subsidiary occupations such as dairying, poultry and sheep rearing to the crop enterprise farming. For this purpose, 60 farms with dairy, 40 with poultry and 40 with sheep rearing units, besides 30 farmers who were engaged in only crop production without any subsidiary occuptation for comparision, were selected from different villages in Nandyal taluk of Kurnool district in Andhra Pradesh. Data regarding labour utilization, income and expenditure and other economic aspects of subsidiary occupations were collected with the help of schedules and pertained to the year 1983-84. The labour utilization pattern was higher by 123, 131 and 116 in diversified farms of dairying, poultry and sheep rearing respectively over the crop enterprise farm. Similarly, the net returns were higher by Rs. 620, Rs. 5,198 and Rs. 1,598 in diversified farms of dairying, poultry and sheep rearing respectively over the crop enterprise farm. Thus, the adoption of subsidiary occupations has enabled the small and marginal farmers to use more of their labour and earn more income. The optimum size of a diversified farming unit should be upto 4-5 milch cattle or 30 sheep or 500 poultry birds to lead a moderate standard of living and also to cross the poverty line.

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DIVERSIFICATION ON SMALL UNIRRIGATED FARMS: A FEASIBILITY STUDY IN THE ARID ZONE OF THE SUB-MOUNTAINOUS AREAS OF HOSHIARPUR DISTRICT OF THE PUNJAB STATE

A.C. Sharma and Rachhpal Singh*

The present inquiry was undertaken to examine the feasibility of diversification at the improved level of technology on small unirrigated farms in the arid zone of the sub-mountainous areas of Hoshiarpur district of the Punjab State. The study was concentrated on 55 unirrigated small farms selected randomly from the operational area of the study following three-stage random sampling technique. The diversification possibilities were examined by developing risk efficient farm production plans for the synthetic situation representing the sample farms operated at the improved level of technology and assuming the adoption of alternative systems of diversification. These plans were constructed by parametric risk programming technique using the MOTAD model. The investigation brought out that crop-cum-cattle-cum-goat-cum-poultry farming followed by crop-cum-goat-cum-poultry farming, crop-cum-cattle-cum-goat farming, crop-cum-goat farming, crop-cum-cattle-cum-poultry farming, crop-cum-cattle farming and crop-cum-poultry farming was the most suited strategy for the diversification of small farms operated by risk averters. The most profitable strategy for the risk lovers however turned out to be crop-cum-cattle-cum-poultry farming, followed by crop-cum-goat-cum-poultry farming, crop-cum-poultry farming, crop-cum-cattle-cum-goat-cum-poultry farming, crop-cum-cattle farming, crop-cum-cattle-cum-goat farming and crop-cum-goat-cum-farming. The crop farming alternative was found to be the poorest choice for the risk averters as well as the risk lovers.

POTENTIALITIES OF MIXED FARMING ON THE RAINFED MEDIUM SIZED FARMS IN JORHAT SUBDIVISION OF ASSAM

D.R. Kalita†

The study was undertaken in 1983-84 to explore the potentialities of mixed farming considering crop farming, crop+goat farming, crop+cattle farming, crop+poultry farming and crop+goat+cattle+poultry farming systems and their impact on employment and credit by deriving optimal production plans using linear programming technique for the rainfed medium farms of Jorhat subdivision, Assam. The relevant cross-section data for the study were collected from 43 medium farms selected randomly following three-stage random sampling frame. The results of the study revealed that the optimal production plans under various farming systems included two new crop enterprises, jute and fodder in *ahu* season and another two, HYV (dwarf) rice and fodder in *sali* season occupying important places in the plans. All the non-crop enterprises raised in the existing production pattern were replaced by Jamunapari goats, cross-bred cows and white leghorn poultry in the normative production plans under different farming systems. Existing mono-cropped area was converted to almost double cropped area through the optimal plans. Among the farming systems, crop+goat+cattle+poultry was found to be the best system followed by crop+cattle farming based

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on income and employment. The lowerst farm income was estimated for existing production pattern. Credit played an important role in the implementation of the various systems of farming.

CHANGING FORM OF CREDIT ARRANGEMENTS IN AGRICULTURE: A CASE STUDY ON WEST BENGAL

Kamal Kumar Datta and Kanailal Basak*

The new agricultural strategy, by providing multiple cropping facilities and reducing output lag of crops has obviously raised liquid need (inward cash flow into agricultural sector), on the one hand; it has also increased the frequency and level of cash expenses on newer technical basis, on the other. Our study argues that multiple cropping contributes to even out the output stream between monsoon and post-monsoon seasons of a given year, thereby forcing the peasants to depend less on consumption loan and more on production loan. In this connection, the relative dominance of traders as creditors is observed in the informal credit market in West Bengal. Further, this study also notes that traders as financiers are distinctly different from other categories of financiers in the sense that their *(i.e.,* traders') basis of lending is the 'potential income' norm of the individual borrower without mortgaging assets as security, while other categories finance the indebted peasants on the basis of their assets position and insist on mortgaging of assets as security. Thus, the former group cares more for the 'productive base' of the farmers than the latter. This marks a significant change in the form of credit arrangements in West Bengal agriculture.

PATTERN OF CONCENTRATION AND DIVERSIFICATION OF CROP ENTERPRISES IN UTTAR PRADESH (PLAIN)

S.P. Upadhyay, Bindhyachal Singh and R.G. Upadhyay†

Indian rural economy is basically considered to be crop economy. The level of diversification and concentration of crop enterprises reflect the extent of economic development in the rual sector. Growth in rural economy can be estimated with the presumption that *(i)* crop enterprises are highly diversified at the initial stage of economic growth because of subsistence cultivation of several crops in the area and *(ii)* at the later stage of growth in the situation of technological breakthrough with (HYV) seeds, dependable irrigation facilities and fertilizer, farmers generally concentrate on few major crops. An analysis of secondary data on area under all crops in Uttat Pradesh with the objective to estimate the level of concentration and diversification of crop enterprises in Uttat Pradesh (Plain) leads to the conclusion that the farmers are tending towards crop concentration and reducing the level of diversification in almost alldistricts of Uttar Pradesh (Plain). The tendency of farm households is to concentrate increasingly on two/three crops, *i.e,* paddy, wheat, gram and sugarcane. Coarse grains are gradually being eliminated from cultivation but some crops of monetary importance are included, *i.e.,* groundnut, rapeseed, *masoor, moong,* potato and maize. Thus, further advancement and expansion of technology and facilities of irrigation, fertilizer, marketing would contribute to concentration of crop enterprises and diversification of other agricultural enterprises in the rural sector.

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DIVERSIFICATION OF MARINE FISHING AND ITS IMPACT ON THE RURAL ECONOMY

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The present study investigates the nature of diversification in marine fishing with the introduction of mechanized fishing methods in Sakthikulangara-Neendakara area in Kerala, the biggest marine fish landing centre of India. The various economic parameters were statistically treated. The introduction of mechanization has not only led to intensification of fishing but also resulted in the growth of diversified fishery associated activites leading to spill over benefits to the whole fishermen community of this region. The enhanced mobility of fishing crafts led to the exploitation of hitherto unknown and under-exploited species and induced many fishermen to shift from traditional to mechanized fishing which resulted in increased landings and consequent transformation of the rural economy of Sakthikulangara-Neendakara into a big commercial centre of marine fisheries. The effort necessary for maximum catch rate was estimated to be 16.20 lakh man-hours which has been surpassed during the late seventies due to continous increase in the number of units in operation warranting regulatory measures for attaining better economic returns in the long run. The higher growth rates in employment, exports and infrastructure facilities over the years indicated a positive impact of diversified fishery activities. The flow of funds to the fishery sector from various credit agencies recorded a phenomenal increase from a meagre amount of Rs. 4.5 lakhs during the pre-mechanization period of 1953 to Rs. 246.9 lakhs during 1980. The increase in the annual and per capita income showed that the diversified fishing activities have led to an increase in the marginal productivity of labour revealing the greater potential of marine fisheries in providing employment. However, it is seen that the fishermen depending solely on the seasonal employment in fishery associated activities require supplementary occupations and suggestions are given to accommodate them in the lean season.

DIVERSIFICATION IN FARMING AND ITS IMPACT ON FARM INCOME AND EMPLOYMENT - A STUDY OF MEHSANA DISTRICT IN GUJARAT STATE

V.K. Madalia†

The objectives of this study were to examine the nature of diversification in farming, the structure of the diversified farms, the investment patterns of these farms, the levels of use of farm inputs, the impact of diversification on farm income and employment and the factors contributing to the success/failure of the diversified farms belonging to the progressive and non-progressive areas of Mehsana district in Gujarat State. The data for this study were collected by personal interview method from 60 farmers of which 30 belonged to the two villages of the progressive Vijapur taluka and the remaining 30 to the two villages of the non-progressive Sami taluka. Vijapur taluka has fertile alluvial soils and assured irrigation facility, whereas Sami taluka has saline soils and poor irrigation facility. For the purpose of this study a diversified farm was considered to be one on which the income from a single enterprise did not exceed 50 per cent of the total income from all the enterprises. The study pertained to the season 1982-83. The findings of the study are as follows : As much as 58.75

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per cent of the total cropped area on the farms belonging to the progressive area was devoted to the cash crops (mustard, castor, cotton, tobacco and isabgul), whereas on those belonging to the non-progressive area 69.75 per cent of the total cropped area was devoted to the food crops (bajra, wheat, jowar, gram and *mung*). Mustard and wheat accounted for about one-fourth of the total cropped area on the respective types of farms. The progressive farms also grew fodder crops, on account of which the herd size of milch animals on these farms was larger as compared to that on the non-progressive farms. In regard to irrigation facility and fixed capital also, the former were in comfortable position.

The net income from all the enterprises per hectare as well as per farm on the progressive farms was three times higher than that obtained on the non-progressive farms. The crop enterprises together on the respective types of farms earned Rs. 1,688.08 per hectare and Rs. 533.19 per hectare which in terms of the percentages to the total income worked out to 69.46 and 60.73 respectively. The remaining 30.54 per cent and 39.37 per cent of the total per hectare income on the respective types of farms were obtained from livestock acivities. Among various crops, cash crops were more remunerative as compared to food crops. The generation of employment by various enterprises was double (405.55 days) on the progressive farms as compared to that on the non-progressive farms (199.56 days). But even after absorption in the non-farm sectors, the farm families under both the conditions had to face the problem of unemployment, which was more acute in the case of those belonging to the non-progressive area.

Much of the success of the farms belonging to the progressive area has been attributed to factors like favourable soil conditions, better irrigation facility; larger area under remunerative cash crops, higher rates of use of farm inputs and larger herd size. The farms in the non-progressive area, on the other hand, operated under severe constraints and hence their income and employment level was very low. There is scope for improving the performance of the farms working under both the conditions by increasing irrigation facility and popularising the use of farm inputs at the recommended rates. The farms belonging to the non-progressive area should be given special consideration in these programmes. Popularising the dry farming practices, increasing the size of the herd of milch animals and encouraging cottage industries on large scale are suggested as other measures to increase the income and employment levels on the farms in the non-progressive area.

DIVERSIFICATION OF AGRICULTURE IN HIMACHAL PRADESH : A SPATIO-TEMPORAL ANALYSIS

Kanwar Prakash Chand and Ranveer Singh*

In the early stage of development the farmers generally grow subsistence crops. As the need for food increases due to growth in human population, the farmers try to produce more to maximize total farm output by using more of better inputs. Therefore, the farmers conc concentrate on few crops. In the third stage, they again diversify their agriculture to strengthen the existing level of development. Diversification in agriculture is also practised with a view to avoiding risk and uncertainty due to climatic and biological vagaries. Himachal Pradesh offers a model of hill farming in the country where cultivation is practised from an altitude of 400 metres to 4,000 metres above mean sea level. In this study an attempt has been made to examine the degree of diversification in hill agriculture. The study is based on both primary and secondary data. The results of the study showed that during the early

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seventies the degree of crop diversification was very high in the districts falling in the mid and high hills. In this region farmers grow subsistence as well as commercial crops. In the low hills the diversification was of medium and low level. High level of agricultural diversification in the mid and high hills is due to climatic advantages. This region besides growing cereal crops is also suitable for the production of temperate fruits, virus free high quality seed potato and off-season vegetables. The low hills of the State do not specialise in the production of any of the high value commercial crops. Relatively low level of diversification in this region can also be ascribed to adverse man-land ratio. The tendency of diversification was relatively low during the early eighties throughout the State except Kinnaur district. This indicates that this State is passing through the second stage of development and is trying to strengthen the level of agricultural development.

Farm level analysis also indicated direct relationship between the extent of diversification in agriculture and altitude. Agricultural diversification and land holding size are directly related to each other in both the regions of the State. It is also observed that between regions, the difference in diversification index is not much in the case of marginal and small farmers, while it is quite substantial for medium and large farms. This indicates that availability of resources is a necessary condition for inducing diversification at the farm level.

To conclude, agricultural diversification is quite complex in Himachal Pradesh. Diversification has benefited more the districts falling in the mid and high hills and medium and large farmers. There is potential for development of horticultural crops in the lower hills also but it has remained untapped due to lack of technical know-how and unremunerative market. There is need to give equal empahsis on the development of horticulture in this region. To the weaker section land is a major limiting factor to increase their farm income. Thus, extension of non-farm enterprise along with assured market for the produce is essential to provide them with sustained and minimum customary level of living.

DIFFERENT SOURCES OF CASH INCOME AND EXPENDITURE IN DRYLAND AREAS

Y.V.R. Reddy†

This study was undertaken at 14 locations receiving low, medium and high seasonal precipitation under different agro-climatic conditions in drylands. These locations are Hissar, Jodhpur, Rajkot, Anantapur and Bellary in the arid region (moisture index from –100 to –66.7 per cent), Rahuri, Akola, Solapur, Bijapur, Bangalore, Kovilpatti and Hyderabad in semi-arid region (moisture index from –66.7 to –33.3 per cent and Bhubaneswar in subhumid region (moisture index from –33.3 to +20.0 per cent). At each location 71-117 households having more than 75 per cent of total cultivable land as dryland area were selected on the basis of proportional to the size of land holdings. The data were collected during 1976-77 to 1979-80 (four years) by investigators – stationed at each cluster/village – visiting as frequently as possible or at least once.

This study revelas that the income is derived from crop production, dairy, agricultural wages, profession/service and non-agricultural wages. The variation in income among different sources is noticed from location to location and from region to region. On an average, the share in total income from crop production is 46 per cent in the arid region as against 37

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per cent in the semi-arid and 20 per cent in the humid region followed by income from agricultural wages. The income from dairy is ten per cent in the arid and 13 per cent in the semi-arid region. The income from non-agricultural wages accounted for 14 and ten per cent in the arid and semi-arid regions respectively.

It is observed that the expenditure on family is more, accounting for 46-72 per cent among different locations and on an average, it is 56 per cent in the arid region, 62 per cent in the semi-arid and 58 per cent in sub-humid region. The balance of expenditure is on farm needs. The expenditure on equipment in the arid region and that on labour in the semi-arid and sub-humid regions are more. On an average basis, the total income exceeded total expenditure per household. The income of the farmer can be improved through better cropping pattern/agronomic practices and diversified farming activities to derive higher cash income in drylands.

DIVERSIFICATION OF RURAL ECONOMY – A CASE STUDY OF CHICKMAGALUR DISTRICT : KARNATAKA

K. Ravi and P.D. Deenadayalu*

This study was undertaken to evaluate the impact of District Credit Plan on Chickmagalur district in Karnataka and to estimate how far diversification has augmented household income for greater stability and future growth and in turn the generation of employment. Three main activities were considered for the study, *viz.*, agriculture, coffee plantation and activities allied to agriculture. Diversification of agriculture took place in the form of increasing the yield by increased inputs, mixed cropping, etc. Coffee planters diversified the maximum by introducing other crops like cardamom, horticulture, etc., mainly because of easy resource availability while the weaker sections diversified their economic activities mainly because of availability of institutional finance. However, the incremental income was generated only by a very few, especially among the weaker sections. Maximum employment opportunities were created by the big planters by diversification. Increased income resulting from diversification under allied activities was to a larger extent misutilized. The major drawback in the diversification process has been the lack of supporting infrastructure including finance. The developmental agencies may have to take more initiative and extend co-operation in the implementation of programmes. The incremental income generated by a minority was spent on consumption as their standard of living was too low, rather than on productive purposes. Lastly, the will to develop in certain sections did not exist.

WHY MIXED FARMING FOR MARGINAL AND SMALL FARMERS? (A CASE STUDY)

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The present study was conducted during the year 1983-84 with the following main objectives : (1) to study the cropping and employment pattern of small and marginal farmers, (2) to determine the cost and returns from crops and livestock enterprises, and (3) to analyse

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the cost-benefit ratio of crops and livestock enterprises on small, marginal and large farms. A multi-stage random sampling technique was adopted in the selection of farmers, villages and block in the district and cash flow technique of benefit cost (B-C) ratio was used to compare these groups of farmers opting for mixed farming and crop production. The study was confined to 100 famers randomly selected from ten villages of Achhalda block, district Etawah in Uttar Pradesh. The study revealed that the crop enterprises hardly met the basic requirements of the marginal and small farmers and hence they are compelled to go in for livestock enterprise side by side and work for wages also in order to cope with their cash needs. The utilization of family labour of marginal farmers on crop production, raising of milch cattle and for other proposes accounted for only about 40 per cent of their total availability of family labour during the year. They remained idle or bound to do *baigar* (serf labour) of the big farmers during the unemployment period.

The results of cost-benefit analysis showed that the diversification of marginal farmers from crop production to livestock enterprises helped to reduce the pressure on land by opening up new avenues of labour employment. Moreover, this would increase the entrepreneurial skill of the marginal farmers, which would eventually increase the marginal productivity of labour. The cost-benefit ratio accruing from milk production of marginal farmers is just equal to the cost-benefit ratio of large farmers obtained from crop production. The small farmers may take to either of the two enterprises as the cost-benefit ratio from livestock and crop production is observed to be equal. Keeping in view the limited cultivated area with them, the marginal and small farmers should be encouraged to adopt mixed farming by giving them loans and subsidies.

IMPACT OF DIVERSIFICATION IN AGRICULTURE ON LEVEL OF INCOME AND EMPLOYMENT OF RURAL POOR IN DISTRICT KANPUR, U.P.

Ram Iqbal Singh, G.N. Singh and S.D.S. Sengar*

The study relates to 60 randomly (30 diversified and 30 non-diversified) selected families of Bilhaur block, district Kanpur in Uttar Pradesh. During the course of selection both the categories were further grouped into marginal farmers and rural labour in equal proportion. The study related to the year 1983-84. It revealed that on an average, there were 2.29 and 2.24 workers, 5.33 and 5.25 family members, 1.07 and 0.63 milch animal and 0.37 and 0.19 draft animal in diversified and non-diversified families respectively. The per worker per annum average employment for diversified and non-diversified families came to 255 days and 206.67 days respectively. The average total income for both the categories of families came to Rs. 4,798 and Rs. 3,672 per annum respectively. The average total consumption expenditure per family per annum for diversified family was Rs. 5,143.42 and for non-diversified family it was Rs. 4,838.65. The consumption expenditure exceeded the income in both the diversified and non-diversified categories of families which resulted into dissavings. On an average, it was Rs. 345.42 for diversified and Rs. 1,166.48 for non-diversified families. The proportion of dissavings to income for both the categories worked out to 7.19 and 31.76 per cent respectively.

It may thus be concluded that the diversification of farm/non-farm activities as a result of introduction of various rural development programmes (SFDA, MFAL, IRD, etc.) has re-

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sulted in raising the level of income and employment of the rural poor to some extent. Still there is much scope to raise their standard of living by further diversification of agriculture, on the one hand and development of cottage and small scale industries in the rural areas, on the other, so that they may be brought above the poverty line.

DIVERSIFICATION IN AGRICULTURE THROUGH GRAPE CULTIVATION — A CASE STUDY

Sushil Kharinta, Kusum Aggarwal and Malkit Kaur†

Among the other horticultural crops, grapes are being increasingly adopted as a measure of diversification in certain regions of Haryana. The present study attempts (1) to analyse the socio-economic conditions of the grape cultivators, (2) to compare the returns from grapes vis-a-vis other crop combinations in the area and (3) to identify the factors leading to the adoption of grape cultivation and the constraints experienced by the farmers. Data pertaining to the year 1984-85 were collected from 20 farmers purposively selected from among the grape cultivators in Hisar district which is the biggest grape growing region in the State. The results revealed that only the big land holders adopted grape cultivation on a part (on an average 0.72 ha.) of their land. The majority of the farmers (55 per cent) sold out their standing crop to the contractor for harvesting and marketing purposes (STC farms) and 45 per cent harvested and sold the crop themselves (SBF farms). The share of grapes in gross farm income was 46.33 and 32.85 per cent on the SBF and STC farms respectively. The cost-benefit ratio was 1:2.82 and 1:1.92 on the SBF and STC farms respectively which was remarkably high in comparison to other crop rotations. Profitability of grape orchard in comparison to other crop rotations and availability of credit facilities motivated the adoption of grape cultivation. Inadequacy of irrigation facilities, bad weather at the time of ripening of fruits, shortage of capital with the majority of farmers and lack of appropriate facilities for training and guidance were the constraints limiting the scope of grape cultivation in the region.

DIVERSIFICATION OF FARM PRODUCTION PATTERNS IN THE RURAL ECONOMY OF COTTON BELT OF THE PUNJAB

G.S. Gill and R.K. Patel*

The study was conducted on 40 farms in the cotton belt of the Punjab State to examine the extent to which the production patterns on different size of farms could be diversified. The data pertained to the year 1977-78. The results revealed that in the optimal production patterns without borrowing of capital (plan A), with relaxation of capital constraint (plan B) and at recommended level of technology (plan C), the production patterns shifted in favour of reasonably paying enterprises but dairying with buffaloes, cows and cross-bred cows could not withstand the economic supremacy of cotton-wheat rotation at existing milk prices on all the farms of different sizes. However, the cropping intensities were sufficiently increased, thereby providing scope for intensive use of land and other farm resources. In the diversified production patterns (plan A), returns to fixed farm resources increased by 4.18, 7.86 and 8.36 per cent over the existing plan on small, medium and large farms respectively.

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The corresponding figures were 4.18, 15.90 and 16.65 per cent in plan B and 30.08, 46.06 and 28.56 per cent in plan C respectively.

The results indicated that small farmers were already making intensive use of their available labour in the existing production patterns but still there existed some scope for increasing labour employment in the diversified production patterns. Diversified production pattern at recommended level of technology promised higher employment potentials of the order of 6, 36 and 54 per cent over the existing plans on small, medium and large farms respectively. Working capital and dairy capital needs in the diversified production patterns were sufficiently increased but were within the reasonable limits which could be met by the farmers by obtaining loans from different financing institutions.

When prices of milk were parameterised by 10 and 20 per cent, there could be no change in the optimal production patterns in plans B and C on any of the farm situations. Even a 30 per cent increase in milk price could not induce dairying on medium and large farms. However, on small farms in the optimal plan B with a 30 per cent increase in milk price, four buffaloes entered the production pattern as permitted by fodder maxima constraint and the crops eliminated were American cotton and wheat and the area under bajra increased due to its lower irrigation requirements. This increased the returns to fixed farm resources, working capital, dairy capital and labour utilization to the extent of 13, 4, 75 and 14 per cent over the existing plan respectively. In the optimal plan C with a 30 per cent increase in milk price, only one cross-bred cow could appear in the production pattern which resulted in an increase of 41, 64, 165 and 15 per cent in returns to fixed farm resources, working capital, dairy capital and human labour use respectively.

To ascertain the level of milk prices or milk yield at which dairying would enter the production patterns on medium and large farms, the range analysis was done. The analysis revealed that on medium farms, 12 buffaloes could be incorporated in the optimal plan B either by raising the milk price from Rs. 1.70 to Rs. 2.55 per litre or by upgrading its performance from 980 litres to 1,473 litres per year at existing milk price. On large farms, the remunerative price of Rs. 2.76 per litre or milk performance level of 1,740 litres per year would enable eight buffaloes to enter the production pattern. Similarly, in optimal plan C on medium farms, profitable milk price and milk yield were Rs. 2.49 per litre and 1,920 litres respectively to enable eight buffaloes to appear in the plan. The corresponding figures for cross-bred cow were Rs. 1.76 and 2,858 litres respectively. On large farms buffalo milk price of Rs. 2.73 per litres and milk yield of 2,014 litres enabled 37 buffaloes to enter the production pattern whereas cow milk price of Rs. 1.93 per litre and milk yield of 3,131 litres enabled 28 cross-bred cows to find favour in the optimal production patterns. The results indicated the urgent need for increasing milk prices and for intensifying research efforts in animal breeding, feeding and management for enhancing the productivity levels of milch animals which would go a long way in the rational diversification of farm production patterns.

CROP DIVERSIFICATION: ITS CAUSES AND IMPACTS ON THE FARM ECONOMY

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Diversification of the rural economy is largely dependent on agricultural activities. At the farm level it may take place in the form of wider varieties of crops (called crop diversifica-

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tion, CD) and/or in the form of new varieties of old crops (called variety diversification, VD). Both these forms are manifested in the cropping pattern of the farm economy. Diversification, in whichever way it takes place, is brought about by a number of factors and it brings about a number of changes. Its nature and extent, causes and impacts are examined in this paper. A new measure of crop diversification is developed and experimented with the farm economy of West Bengal. The analysis is based on the farm management data in West Bengal. We have taken a sample of 108 irrigated farms, all of which are constant in size during the period 1972-73 to 1978-79. Entropy analysis entails that farms in general have increasingly practised both CD and VD in their farm activities. The mode of farming, the degree of mechanization and the farm size have been effective in enhancing diversification. Diversification is more pronounced in the capitalist farms than in the peasant farms. Mechanization affects diversification directly. Small farms are more crop diversified than medium and large farms. Diversification affects the farm economy in many ways. Regression of farm business income (FBI) entails that both CD and VD have direct significant impact on FBI. FBI is more influenced by CD than by VD.

A STUDY OF DIVERSIFICATION OF AGRICULTURE IN AGRA DISTRICT OF UTTAR PRADESH

Balishter, R.K. Singh and Roshan Singh*

The paper makes an attempt to examine the diversification of enterprises at farm level based on an enquiry of a sample of 42 farmers selected on stratified random sampling basis from the villages of C.D. block Bichpuri in Agra district (U.P.). The farmers were selected from small (below 2 ha.), medium (2 to 4 ha.) and large (above 4 ha.) farm size-groups in proportion to their number in each size-group in the three villages. This sample was selected for a study conducted in 1961-62. A similar sample was taken up for study from the same villages in the year 1983-84. The results of the study indicated that the average farm size has increased in the case of the small farms while in the case of medium and large farms it has decreased. It is possible that with the introduction of new farm technology leading to a marked increase in income and also increasing inputs may have motivated the small farmers to make their farms more viable (by leasing in land) and the medium and large farmers leasing out a part of their land to others because of relatively higher outlay on farm inputs. This observation, however, needs further examination.

In 1961-62 only 73 per cent of the total cultivated area was irrigated but in 1983-84 the entire cultivated area was irrigated. Canal and wells (Persian wheel) were the important sources of irrigation in 1961-62 while the private tubewells either exclusively or as supplemental sources to canal irrigated area have become the most important source in 1983-84. It indicates that with the introduction of new farm technology assured source of irrigation was a necessity and with prospects of higher returns on this investment, the farmers were willing to make investments for increasing the assured sources of irrigation. There has been an increase in investment in fixed capital in 1983-84 over 1961-62 in all the three categories of farms. This increase in the value of farm capital was due to the acquisition of additional physical assets in the form of tractors, tubewells, pumping sets purchased through availability of bank credit to farmers after the nationalisation of banks.

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The percentage of cropped area under *kharif* crops on the whole has declined in 1983-84 over 1961-62 while the area under *rabi* crops in the corresponding period has increased. In 1961-62 there was no area under *zaid* crops but in 1983-84 these crops accounted for about 5.5 per cent of the total. In view of the development of assured irrigation, the farmer is inclined to reduce his dependence on rains for growing his crops successfully. In the *kharif* season there has been a shift of area from jowar to bajra, vegetable and paddy. Cotton and sugarcane have disappeared. This shows a shift from low income crops to high income crops. In the *rabi* season the area under *desi* wheat has entirely shifted to high-yielding varieties. The area under pea, gram, barley and *rabi* grain mixtures has virtually disappeared. This shows that diversification of *rabi* crop enterprises has been considerably reduced showing a clear trend towards specialisation and also there has been a shift from low income crops to high income crops where none was grown earlier. This is an outcome of availability of high quality seeds, fertilizers and assured sources of irrigation. Thus the new technology is apparently influencing the crop enterprises at the farm level towards more specialisaion than diversificaion. Wheat and bajra contributed together about 39 per cent of the gross farm income in 1961-62 but in 1983-84 these two crops contributed about 73 per cent of the total and these together with vegetables and mustard accounted for about 90 per cent of the total farm income. Wheat alone contributed about 56 per cent of the total farm income and thus it is a case of specialised farming leading to not only higher but stable farm income. Thus the technological development in agriculture has led to reduced diversification of enterprises at the farm level. Dairy contributed about 8 per cent of the total farm income in 1961-62 which came down to only about 7 per cent in 1983-84. Thus the farmer on the whole has not bothered to develop his dairy enterprise and it continues to be only for family consumption. It cannot be considered as a case of mixed farming.

On the whole, there has been marginal increase in labour use per hectare of cultivated area. In the case of small and medium farms the increase was marginal while on large farms there was marginal displacement of human labour. This is due to mechanization of certain farm operations and minimum tillage concept. Thus specialisation in crop farming has not led to any significant impact on labour use.

PATTERN OF INCOME AND ITS DISPOSAL UNDER DIVERSIFIED FARMING IN DISTRICT KANPUR

S.R. Yadav, O.P. Rana, T.R. Singh and H.K. Nigam†

The study on the pattern of income and its disposal under diversified farming was carried out in development block Kalyanpur in Kanpur district, Uttar Pradesh in 1984-85. It covered a sample of 100 farmers falling under three size-groups, *i.e.*, 55 in small (0-2 hectares), 32 in medium (2-4 hectares) and 13 in large (above 4 hectares) holdings selected randomly from five villages of the block. In the selection of sample farms, the farmers using modern inputs and keeping livestock as a subsidiary occupation were taken into consideration. The average size of holding of the sample farmers was 2.29 hectares; the average area under irrigation was about 85 per cent; the farmers on an average had 2.1 milch animals each. The study revealed that the value of capital per hectare was Rs. 3,444, Rs. 3,403 and Rs. 3,319 in the case of small, medium and large farms respectively. Small farmers supplemented their family income from milk business which accounted for about 23 per cent of the total income, while income from crop production was 62.6 per cent of the total. The share of milk

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business in total family income of the medium and large farmers was 16.2 per cent and 12.5 per cent and that of crop production was 72.2 per cent and 75.7 per cent respectively. Income from business and services accounted for 11.7 per cent, 10 per cent and 5.6 per cent of the total family income in small, medium and large size-groups respectively. The small, medium and large farmers respectively spent about 69 per cent, 57 per cent and 54 per cent of their income on family consumption (food, clothing, housing, education, social ceremonies, etc.). Investment on farm capital accounted for another 5.4 per cent, 6.7 per cent and 5.9 per cent of the total income in the correspvestment in non-farm capital was about 8 per cent in each of the three size classes of holdings. The repayment of institutional credit and old debt accounted for about 7 per cent, 11 per cent and 10 per cent in these three size-groups respectively. Investment in saving, life insurance, etc., accounted for about 5 to 7 per cent in the three size-groups while the share of other investment in total family income constituted about 5 per cent on small farms, 13 per cent on medium farms and 17 per cent on large farms. The study revealed that there is vast scope for insitutional agencies to mobilize farm income for reinvestment.

TOWARDS DIVERSIFICATION IN PUNJAB AGRICULTURE (A CASE STUDY)

J.S. Chawla and T.S. Chahal*

This study attempts to examine the trends in income and relative share of various economic activities in the total net income of different categories of farmers consequent upon diversification. It covered 300 farmers, 118 marginal, 62 small, 58 medium, 44 large and 18 big with holdings upto 2.5 acres, 2.5-5, 5-10, 10-20 and above 20 acres respectively selected randomly from 15 randomly selected villages spread over five randomly selected blocks of the district Amritsar in Punjab. Relevant data were collected from the selected respondents with the help of a schedule. Budgeting technique was applied to estimate the returns to fixed factors. It covered a period of ten years from 1974-75 to 1984-85. The study revealed that the net income of the marginal, small, medium, large and big farmers increased by 93.25, 106.80, 66.13, 108.25 and 160.23 respectively in 1984-85 over 1974-75. The big farmers reported the maximum increase as compared to the other categories due to the induction of capital intensive enterprises like local transport. Moreover, they hired out farm machinery and derived income from forestry. The marginal and small farmers doubled their income in 1984-85 as compared to 1974-75 due to the induction of dairying and off-farm work. It was also true for 1979-80 compared to 1974-75. The relative significance of differnt enterprises is as follows : Income from crop producion decreased over the years as well as in relation to farm size. Income from dairying, poultry, piggery, forestry and local transport expanded over the years as well as in relation to farm size. The marginal, small and medium farmers got increasing income from dairy, poultry and miscellaneous sources whereas the large and big farmers obtained more income from forestry, local transport and miscellaneous source. Therefore, the impact of diversification was apparent in all categories of farmers.

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DIVERSIFICATION OF THE RURAL ECONOMY AND ITS IMPACT

B. Bagchi and K. Sain†

The ushering in of intensified agricultural activities in the late sixties in India and afterwards witnessed a spate of diversification of the rural economy in the form of introducion of new crops, new and hybrid varieties of old crops including tree crops and forest products, livestock and animal products, fisheries, new types of agro-and cottage industries and agro-services and agro-businesses. This exercise aims at, first, studying the extent of diversification over a little more than a decade in a specified region. Secondly, the impact of such diversification on the individual economy of the farmers concerned in this study area is noted. Thirdly, differences in the degree of diversification and its impact on different economic groups of farmers were examined. Finally, an attempt was made to probe into the obstacles in the way of diversification of the rual economy and some suggestions were offered for expediting its progress in rural India. Data are marshalled mainly from the reports of Farm Management of the Government of West Bengal for the years 1967-68 and 1978-79. Other sources of data are Economic Survey of the Government of India, Economic Review of the Government of West Bengal and Reports of the National Commission on Agriculture. The findings from this study are presented in tabular form for their convenient presentation. These are put to tests of significance, wherever necessary, for reinforcing the conclusions. Observations regarding the extent and impact of diversificaion as well as the performance of distinct economic groups of farms in this connection are presented so far as these relate to the specified area of study in West Bengal. Altogether 120 sample farms of 15 villages belonging to five districts of West Bengal during the years 1967-68 to 1978-79 are covered. Observations on similar aspects relating to some other component States of India are noted and interpreted.

It appears that diversification has progressed in the area under study as well as in the different component States of India since the mid-sixties of this century and has conferred substantial benefits on the farmers concerned. The economy of the country as a whole has also benefited from such programmes. But various impediments stand in the way of harnessing the full potentialities of such a diversification programme. It is suggested that both official and non-official organs associated with farm development should get rid of their age-old indifference towards farming and should take bold and firm steps for the rejuvenation of the agrarian economy and for its diversification by facilitating proper execution of scientific cropping pattern, bio-fertilization programmes, various types of irrigation programmes, dryland development programmes and credit supply programmes. Sincerity is needed both in planning and in execution for the success of any programme of diversification of the rural economy.

INDUSTRIAL GROWTH AND DIVERSIFICATION OF FARM ECONOMY — AN EMPIRICAL INVESTIGATION

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The study is designed to examine the degree of diversification of farm economy in relation to the influence of industrial growth of Ranchi in Bihar. Four distinct components of farm

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economy, *i.e.*, cropping pattern and irrigation structures, farm and non-farm employment, capital investment and estimates of income and expenditure were examined. Transcendental production function was done to evaluate the production and resource use efficiency on sample farms in three zones. The basic data for the study were collected by survey method from 144 farms spread over 12 villages around Ranchi industrial complex. To make the data amenable to cross-sectional analysis, distance concept was adopted in selecting the villages. The villages around Ranchi were stratified into three zones at distances of upto 10 km., between 10-20 km. and between 20-30 km. from the outter limit of the municipal area. Four villages from each zone were selected for the purpose of the study. The period of enquiry was from July 1977 to June 1978.

The results of investigation have amply demonstrated that the sample farms in zone I situated within the radius of 10 km. from the outter limit of Ranchi municipal area have diversified their farm economy in order to meet the growing demand of non-farm population concentrated in the urban centre. Farmers in zone I followed by those in zone II have diversified their cropping pattern by introducing high-yielding varieties of food and cash crops in over 33 per cent and 28 per cent of the gross area sown respectively. There is also a relatively higher area under irrigation. The intensive use of labour and capital resource input accompanied by higher return per unit of investment in these zones is largely motivated by price factors and profit margins. Diversification of family labour force (both male and female) to non-farm jobs has been witnessed on the sample farms in zone I due to adequate opportunity of wage-paid employment in the urban centre. However, there is high concentration of family labour force on farm jobs in zones II and III. Farmers in zone I have recorded a higher rate of investment on farm and capital formation and income generation in agriculture as compared to the other two zones. The results of transcendental production function have revealed that the production and resource use efficiency on the sample farms in zone I is conditioned by the diversification of farm resources. This has reduced risk aversion and income variability. The highly significant 'b' value for all the three variables – cost on labour (human, bullock and machine), capital expenditure and irrigation charges on per hectare basis–in zones I and II indicate that there is further scope to increase the level of investment on these resource components for higher income and per unit productivity. Farmers in zone III are tempted to diversify their irrigation structures in order to create conditions for higher investment on other components of the farm economy.

IMPACT OF DIVERSIFICATION OF RURAL ECONOMY ON INCOME AND EMPLOYMENT OF SMALL FARMERS AND AGRICULTURAL LABOURERS: A CASE STUDY OF DAIRY ENTERPRISE IN RURAL TAMIL NADU

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This paper examines whether diversification of the rural economy through dairying under IRDP was beneficial to the small farmers and agricultural labourers in the study area, and if so what were the favourable circumstances that rendered it possible. The impact of diversification of the rural economy through dairying on samll farmers and agricultural labourers is assessed by examining sets of data relating to their income and employment in

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the pre- and post-diversification. For the study, two blocks, namely, Madathukulam (block I) and Pongalur (block II) in Coimbatore district, Tamil Nadu, where the concentration of small farmers and agricultural workers together was relatively high, were purposively chosen. Fifty per cent of the beneficiaries among small farmers‡ and agricultural labourers respectively in each block who received commercial bank loans for the first time for dairy enterprise during the year 1982-83 were selected at random.

The impact of dairying as a means of diversification of rural economy on small farmers and agricultural labourers in the two selected blocks is diverse. For instance, the small farmers in block I have been able to improve their income and employment levels due to dairying. This has been possible due to their relatively better resource base in the form of irrigated land and better infrastructural facilities. The small farmers in block II however are deprived of these favourable circumstanes, and are encountered with a situation of poor resource base due to dry cultivation, lack of fodder, lack of infrastructural facilities, etc. As a result, the impact of rural diversification on improving the income status of small farmers in block II is not perceptible. Although some of these unfavourable circumstances prevailed in the case of agricultural labourers in both the blocks, those who have had better access to institutional and infrastructural facilities have been able to improve their economic status. Therefore, the access of small farmers and agricultural labourers through bank credit for the purpose of dairying aimed at rural diversification though welcome is only partial and it should be backed up with many support services to realise the benefits in full.

DIVERSIFIED FARMING FOR AUGMENTING FARM INCOME: A STUDY OF TYPICAL FARMING SITUATION IN TRICHUR DISTRICT, KERALA STATE

K. Mukundan*

This paper makes an attempt to evaluate the costs and reurns and resource use efficiency in rice culture and pisciculture in Trichur district, Kerala State. The study was made in 1985 and the data related to the year 1983-84. A net profit of Rs. 1,812, Rs. 610 and Rs. 320 was obtained from one hectare of paddy land for *Virippu* paddy crop (autumn), *Mundakan* crop (winter) and *Puncha* crop (summer) respectively. A total net profit of Rs. 2,742 was obtained by growing three paddy crops in one hectare of land for one year by investing Rs. 15,940. The total cost per year for rearing fish in one hectare of pond worked out to Rs. 18,025 and a net profit of Rs. 22,675 was obtained. The benefit-cost ratio for rice culture in one hectare of land was 1.17 and that of pisciculture was 2.52. The additional income that is obtained by rearing fish over paddy cultivation is very attractive and such a resource diversification is worth trying on a larger scale for the maximization of profit from an unit area of land and for the benefit of small farmers with less than one hectare of land who constitute 90 per cent of the farming community in Trichur district.

FORMS AND FACTORS OF DIVERSIFICATION

A.K. Giri and S. Gandopadhyay†

This study was undertaken in geographically homogeneous adjacent five villages in Naihati Police Station of the district of 24 Parganas in West Bengal with a view to *(a)* exa-

‡ Defined as those having less than 2.5 acres of irrigated land and 5 acres of unirrigated land.

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mining the forms and extent of diversification of farm households; *(b)* to study the association between the intensity of land use and the intensity of adoption of non-crop enterprises and also to observe the relation between the intensity of land use and size of operational holdings; and *(c)* to examine the relation of various socio-economic factors with the size of various non-crop farm enterprises. The study revealed that for diversifying their farms, farmers adopted not only multiple crops on the same land but also adopted various non-crop enterprises like dairy, poultry, fishery, orchards of mango, banana, papaya, and vegetables. Among the households surveyed, 47 per cent adopted any one of these non-crop enterprises along with their usual crop production. Thirtyone per cent and 6 per cent of them adopted any two and any three non-crop enterprises respectively along with their usual crop production. The intensity of adoption of non-crop enterprises was not very much related with the intensity of land use. Inverse relation between the size of operational holding and adoption of non-crop enterprise and positive relation with the size of operational holding and intensity of land use were observed. Examining the relation of socio-economic factors like the size of operational holding, size of family, proximity to market, extent of non-farm income, extent of perennial non-crop income and levels of education with the adoption of various non-crop enterprises, it was found that the size of dairy unit was independent of the size of operational holding, but depended more on the availability of non-farm income. The area allotted to vegetable production depended on the size of operational holdings, and the proximity to market or urban centre favoured its production.

IMPACT OF DIVERSIFICATION ON THE HOUSEHOLD ECONOMY OF WEAKER SECTIONS

C.B. Singh and S.P. Sharma*

The paper seeks to examine the extent and impact of diversification on various important parameters. The investigation, based on 100 sample households of weaker sections of the adopted villages around Karnal, revealed that there was a gradual shift in the use of limiting resources like land and capital due to diversification in farm products effected by technology transfer programme. The households shifted to new and high-yielding variety of crops, new techniques of production and incorporated improved dairying with high-yielding milch animals. Thus farm diversification affected the cropping and investment patterns. The use of fixed capital in dairy and crop enterprises increased by 11 and 5 per cent respectively during the post-diversification period over that of pre-diversification period. It was observed that by and large, farm diversification had positive impact on production, consumption and marketed surplus of major farm products such as paddy, wheat and milk as well as farm income of the households of weaker sections during the post-diversification period. Improved dairying was found to be a feasible and economically viable enterprise as was reflected by the highest net income of Rs. 738 earned from dairy enterprise per landless labour household during the post-diversification period. However, new technology, required facilities including credit and organized marketing are the pre-requisites for making dairying a viable enterprise. Besides, various identified techno-economic constraints of dairying need to be tackled urgently by the planners and the administrators so that the weaker sections could derive full benefits of diversification.

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MIXED FARMING ON TRIBAL FARMS (A STUDY OF BHARMAUR TEHSIL OF CHAMBA DISTRICT, H.P.)

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An attempt has been made in this study to determine the levels of size of sheep herd and cattle along with the cropping pattern under different resource restrictions and technology. The impact on employment and income is specifically examined. The objectives of the study are *(i)* to work out the labour utilization for different categories of tribal farms and *(ii)* to estimate the income levels for different categories of tribal farms under varying resource restrictions. Bharmaur tehsil in Himachal Pradesh was purposively selected. Ten per cent of the inhabited villages were randomly selected. The farmers were classified into two groups, *viz., (i)* those having sheep/herd and land and *(ii)* those having land only. Each category was further subdivided into two. Thus four groups, small farms with sheep (group A), large farms with sheep (group B), small farms without sheep (group C) and large farms without sheep (group D), were studied. In all, 136 farmers were selected in group A, 22 in group B, 64 in group C and 18 in group D. Linear programming technique was used to find out the optimum combination of sheep, cow and crop farming. Integer programming was used to find out the integer values for sheep and cow. The analysis was undertaken under four different farm plans.

The results indicated that the family labour, which was assumed to be surplus under existing technology in the selected tribal area, was less under-employed on mixed farms compared to farms without sheep. With the introduction of modern agricultural technology, the family labour was fully utilized and when labour restriction was withdrawn, additional labour was required, thereby indicating a high marginal value productivity of labour for all the peak periods. The farm income was found to be higher on mixed farms under both the categories. With the adoption of modern technology, the farm income increased substantially under both the categories under study. It is interesting to note that the gap between group A and group C in plan I (existing resources with existing level of technology) was significantly reduced under plan IV (existing resources, modern technology, capital borrowing and hiring-in of labour), which implies that with the adoption of modern technology, the income disparities can be reduced.

DIVERSIFICATION ON FARMS

K. Mani and S. Varadarajan*

At farm level, diversification is noticed not only in crops grown but also in combining other productive enterprises such as dairying, sheep rearing, poultry, piggery, inland fisheries and to some extent transport, processing and other marketing activities. It helps in achieving growth and stability in farm business. Multiple cropping seeks to improve productivity per unit area of land within a specified time (say per ha. per year) by repeated and/or intensive cropping. But, in a labour surplus, land scarce economy like India, increasing productivity of land is only the first step. For making efficient use of surplus labour with limited land to support it, other activities – that are not based on land supply and add income and employment opportunities – should be added to the portfolio of farms. Incidental-

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ly or through deliberate choice, the enterprise mix of crop and non-crop activities reduces farm risks. Therefore, diversification on-farm deserves a close look.

The objective of this study is to measure the extent of diversification on-farm and to relate it to income, employment and risk of farm business. The extent of diversification was measured by Gibbs-Martin method. This index was studied for its relation with actual income and employment of the farm as a whole. Farm risk was measured by the coefficient of variation of farm income. Finally, to measure the influence of diversification of farm activities on income, employment and risk, the latter were regressed individually on diversification index. The results showed that it was the large farms which diversified the most and small farms followed next. Functional analysis showed that diversification had helped farmers to reduce risk in farm business, but not for increasing farm income or for reducing labour use. Rrsearch might help them to combine the goals of income, resource use efficiency and reduction of risk.