Proceedings of the Symposium on "Poverty And Agriculture"

Chairman   :   Shri V.R. Rao[*]

Convenor   :   Dr. Shivtar Singh[□]

At the outset, Prof. Prem Narain, Secretary, Indian Society of Agricultural Statistics and former Director, IASRI, New Delhi welcomed the participants and requested Shri V.R. Rao, Former Director General, C.S.O. to chair the session. Prof. Narain in his introductory remarks, highlighted the importance of the theme of the symposium and stressed that although discussions had been held in the past at various forums to define and measure poverty but still many methodological issues remain unresolved. In particular, there is divergence of views regarding the measurement of poverty although alleviation of poverty has become one of the major targets during the Eighth Five Year Plan.

The Chairman in his opening remarks, dwelt on the complexities of the problem and briefly mentioned rural development programmes initiated by the Government of India in successive Five Year Plans to benefit the specific groups of the rural poor. He hoped that aside from the universalisation of elementary education, provision of safe drinking water and health care, containment of population growth, expansion of employment opportunities, augmentation of productivity and income levels of both the under employed and unemployed poor would be the main instruments of elimination of rural poverty during the Eighth Plan. Thereafter, he called upon the invited speakers to present their papers.

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Six Speakers namely, Prof. P.V. Sukhatme, Dr. M.S. Bhatia, Dr. Padam Singh, Prof. Prem Narain, Shri Dibakar Naik and Dr. C.S. Rao presented their papers. As per the request of the authors, the paper by K.C. Seal and P.C. Bansil was presented by Dr. Padam Singh. Thus, in all 7 papers were presented and discussed. Apart from the six speakers, Prof. P.K. Bose, Dr. C. Mishra, Dr. K.M. Satapathy and Dr. Meenakshi Bai also expressed their considered views.

Based on the presentation of invited papers and discussions held as also the Chairman's observations, the following recommendations were made.

- The massive data at village level generated through censuses should be computerised, & they should be transferred to floppies in the first instance. Specific softwares may be developed to obtain reliable statistics at any desired micro level for identifying the target groups for implementing the poverty alleviation programmes.

- There is an urgent need for conducting repeat sample surveys on continual basis to study the impact of poverty alleviation programmes on the rural poor by an agency other than the implementing one.

- There is need to resolve some of the issues relating to definition and measurement of poverty, identification of the poor, monitoring and evaluation of poverty alleviation programmes.

- Apart from deriving estimates of poverty ratio based on available country wide data on consumption expenditure, there is need to carry out supplementary field studies at regular intervals to the find out the proportion of the population who are 'visibly deprived' of basic human needs, viz. food, clothing, shelter, health care etc.

The summaries of the papers presented and discussed are as follows.

1. *Alleviation of Poverty Through Balanced Nutrition and Rural Sanitation*

P.V. Sukhatme[*] and W.C. Edmundson

Alleviation of Poverty has been the goal of India's planning since the very beginning. Some one-third to one half of India's population is estimated to suffer from protein malnutrition. Their nutrition status is so low that in the opinion of the U.N. Committee on Science and Technology the economic, social and physical development of our people is likely to be completely arrested if prompt steps are not taken to feed the people with protein rich foods and arrangements are not made within the country to produce protein foods using modern food technology in quantity large enough to meet the needs.

In the first flush of advances in food technology protein for strength became the slogan. There was the assumption that protein deficiency could be overcome by simply increasing protein in the diet. But soon people found that this course of action was not effective. Apparently diets eaten by the people did not lack the minimal quantities of protein. On the contrary, the protein problem was more often the problem of inadequate energy, which causes the body to catabolise the protein or additional stress from a communicable disease which causes the body to catabolise upto twice its normal need for protein. Their finding was exactly the opposite of the simple supplementation measures advocated by the U.N. Available data show that people who are deficient in protein will almost always be low in energy intake. Moreover protracted cases of diarrhoeal diseases and upper respiratory diseases interfere with or even reverse the utilisation of food energy. In our villages post weaning infants are ill, on an average, once a month with diarrhoeal or upper respiratory episodes. It means that no sooner a child recovers from one episode and is set to gain in weight he is ill again with some infection or other. And once a child is ill with one bacterial infection or other he/she will not grow.

It is against this background that India has set school feeding as its top nutritional priority. The foremost project in this line is a massive Integrated Child Development Services Program (ICDS). It was started in 1975. It includes, as its keystone, an institutionalized, supplementary child feeding program, which despite its high cost and moderate benefit, is the most widespread and politically popular form of nutrition intervention in India.

With such widespread and long term projects, the quality of local involvement is naturally found to vary tremendously from place to

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place and time to time. But having said this the fact remains that we have little or no evidence of major improvements in nutritional status of our population. The broad facts are that well over half the children are small in stature; and nutritionists hold that inadequate food intake is the major cause of the situation. On the other hand, it is also clear that food interventions to increase intake to equal intake of counterpart children in USA have not materially improved the situation. They have failed. What then is the justification for setting up ICDS? And why are our children small?

Surveys carried out by one of our Ph.D. students, Mrs. M.K. Gokhale, throw light on this problem. The purpose of her study was to evaluate the impact of ICDS on pre-school children from urban area after 2 years, eight years and eleven years. What she did was to observe children in the ICDS group for gain of nutritional status as judged by : (1) Gain in weight and height for age, and (2) change of morbidity in successive rounds. Along with children from the ICDS group, she also observed children from the non-ICDS group living under comparable conditions in the same slum areas. She found that children in the ICDS group benefited more than children in the non-ICDS group; but the gains were small. As against this, the data show no statistically significant evidence of any change in morbidity.

The surveys in the slum were the cross-sectioned type, as the same children could not be examined in the follow up survey after five years. Since ICDS is also operative in rural sections, a longitudinal survey was designed in the rural village of Murhevasti near Pune city. In the longitudinal follow up study of 107 pre-school children, prevalence of malnutrition estimated according to Gomez classification, was found to be static showing no improvement or retardation in nutritional status. Analysis of the data pertaining to 26 common children of the 107 showed that in 62.5% there was no change in grade of malnutrition while in 16.7% of these children, improvement in the grade was observed and in the same percentage as 16.7% deterioration in the grade was seen.

To find out the plausible cause for the failure to get improvement, the available data were further analysed. Basic assumption in Gomez classification is that a healthy active child moves within 10% of median weight. Accordingly four grades of malnutrition are defined. However, some children in our data are seen to grow twice as fast as others with relative ranking in growth rates changing rather considerably from one interval to another as they grow. In other words, they grow in spurts. Analysis of variance for percentiles of growth increments for each four months interval showed that

intra-individual variation in children is over three to four times as large as estimated true variance between them i.e. children change paths over fairly wide range depending upon location in time and momentum they receive. The relationship between weight and intake is not linear in growing period. The implication is that fixed supplement cannot be expected to produce the same change in body weight, in all children even when they are similar in age and status. Results obtained by Sukhatme P.V. on healthy US children are of similar type.

In the Murhevasti survey, the well water samples were analysed in the laboratory for microbial counts almost every week. It was observed that well water was constantly contaminated throughout the study period. High morbidity was also persistent throughout the study period. More rapid growth occurred when they were well.

In the light of these findings, ineffectiveness of supplementary feeding programs may be attributed to environmental factors and a high disease load among the children. A study was therefore planned to examine the role of environmental factors in determining nutritional status of children and their morbidity. The survey was undertaken in a Montessory School in Pune city where PMC water supply was available and Supplementary Feeding Program was well organised privately by the school authority. The data on 302 pre-school children shows a close association of environmental status and morbidity with nutritional status of children (p < 0.05). It was also observed that severity of illnesses is significantly more in poor environment than in good environment.

We have several other studies carried out in our villages which confirm that diarrhoeal and respiratory diseases are the most common and most dangerous diseases among children. It is not, easy to estimate diarrhoeal prevalence since many people are not aware that they harbour disease. What we need is actual examination of stools. Our studies show that the point prevalence of diarrhoea varies between 4 to 9% in children under 12. Study of stools in different patients, such as those carried out in Kerala nd in Bombay confirm this finding. The Kerala results show that one out of every two episodes of diarrhoea is bacterial in origin. The Bombay results of the analysis of 50,000 samples put this number at a little over one half. We find that the annual prevalence of diarrhoea could be of the order of 40 to 50%.

With such a high prevalence of diarrhoea and also of respiratory diseases, it is to be expected that mortality is also high. It is estimated that one in every 5 deaths among children of age 1

through 4 years of age occurs on account of diarrhoea and an equal or slightly higher proportion from respiratory diseases. Together, they seem to account for well over 40% of the total mortality among children between 1 to 4 years of age.

Briefly, our experimental results over the last 10 years confirm two things :

1. The principal cause of diarrhoea is poor sanitation, and

2. The principal cause of severe malnutrition is prolonged diarrhoea.

An intensive field study was undertaken in village Kirkatwadi to study the effect of nutritional intervention on body weight and size and in particular, to know whether education in sanitation and use of latrines and piped water lowered morbidity and increased growth. The study confirmed that the answer to these questions lay in taking note of the continuous and intense interaction of cultural, economic and physical environments with biological environment. The experiment showed that education along Gandhian lines organised round a given social action serves to bring out the hierarchical nature of variation as the main cause of children.

We followed up this experience by initiating a new eight villages project with funds from the Department of Science and Technology. The villages selected for the project were Rahatwade, Vardate, Marnewadi, Batulsar, Arvi, Kasarwadi, Murhevasti and Khandala.

In 1984, following the Kirkatwadi model, we had fences built around the schools in all the 8 villages, with latrine within the village campus. This was followed up by setting up Balwadies in each village. We instituted a new health education syllabus. In 1986, wells in 4 of 8 villages were capped and well water was regularly chlorinated and analysed for E. coli count. In 2 of these villages, latrines were built, one for every 3 households. Morbidity was regularly recorded. We found the prevalence from diarrhoreal morbidity was reduced by well over one-third at the end of the 3rd year.

Many economists hold that low levels of intake lead to low productivity and low productivity to still lower levels of income and intake. This hypothesis of a vicious cycle of poverty, malnutrition and impaired labour power is especially expounded by international agencies. However, as Myrdal has pointed out, a question arises whether such statements can be supported by empirical observations of work in the field. In reality, evidence of available surveys show that the poor work longer hours and are fully

employed in work of low productivity characterised by a lot of work to do with very low returns.

There is a long and complex pathway between energy intake and work output. Low intake does indicate low output but it is also true that a small individual on low intake utilizes the intake more efficiently than a large person. Small villagers on a low plane of nutrition may likewise devote more of their time to economically productive labour. Large intake dictates higher total output but that output need not be directed towards productive work, with the result that large intake may be less efficient in changing food energy to energy for work. Thus a group of trained observers or supervisors observing villagers or women working in the kitchen could detect no discernible difference in the observed work output of individuals with low/high energy intake.

The poor will not survive if they do not work for long hours. Their physiological energy expenditure may increase with intake, but not necessarily their economic work output. This puts the problem in a different perspective altogether.

Poorer individuals with low food intake may be small in body size, but they work long and hard and further there is plenty of evidence to show that the relationship between their intake and the economically productive part of this work output is small. It is high time that we learn the hard truth that habitual energy intake influences the BMR and not the work output. There is therefore no reason to assume that absolute energy intake is the determinant of work output.

Even a simple analysis can tell us that if the current belief that BMR is essentially fixed for given body size, then work output would increase rapidly following introduction of food interventions at low levels of intake. Thus for a small man with BMR of 1400 calories per day, a change in intake from 1900 to 2400 calories would double his potential for productive work output from 500 to 1000 calories in theory. However, empirical evidence does not corroborate this expectation because our experimental results in the open Metabolic Unit have shown that BMR is more determined by compensatory mechanism than by man's body weight.

Metabolic experiments in our laboratory have repeatedly confirmed that when habitual intake is shifted by 10 to 20% under a sustained perturbation of external environment, BMR is also altered by about the same margin. The implication of this conclusion is far reaching but it has been ignored by the working groups of the Planning Commission in drawing up nutritional standards and

programme for the country. In our book Diet, Disease and Development written by Edmundson and me, we have shown that work output per calorie remains approximately constant over a range of intake. The major problem with low intake is not starvation as commonly believed, it is that of forced adaptation resulting in marginal reserves which are often found insufficient to cope with external stress.

The Working Group on Poverty and Education of the Planning Commission has failed to consider human variation and adaptive regulation. Defining a poverty line by saying those failing to meet recommended levels have impaired work power or permanent hunger is a mistake. This does not mean that undernutrition does not exist, it does. Indeed it is undernutrition which is largely responsible for catabolising the protein that an individual eats that is responsible for the large incidence of protein malnutrition and prompts Westerners to recommend increase of good quality protein in our diet for improving health.

Supplementary interventions should help to increase nutrition status under ordinary conditions if given to younger pre-school children earlier in their growth cycle.

What however stands in the way is the fact of morbidity and infections. If ICDS and IRDS have failed in the past to bring about improvement it is because we have failed to understand the role of synergistic relationship between intake and disease as also between intake and work output in adult individuals. It is these findings which give a different turn to the problem of health and vitality of the poor.

The first evidence of this came in 1981 when Immink and Viteri realised the difference between total physiologic and economic energy expenditure in their work in Gautemala. They found absolutely no increase in productivity of sugar workers even after giving energy supplement. Total physiological energy expenditure increased after supplementation but economic productivity in work did not change either in intensity or duration. In the data reported by Edmundson from his work in Indonesia and village Katavi in India, he found a very small correlation between the intake and productive work output. Our Indira Community Kitchen data confirm this. This is not to deny that heavy work output is facilitated by large body size but the time spent on heavy work in the normal course of one's duties is hardly more than half an hour or so.

But even a graver mistake is that the poverty group does not realise the consequences of using the calorie norm as the cut-off

point for measurement of the number of poor. By doing so we are unwittingly harming the interests of the backward communities in benefiting from the programs for the poor. Had it been otherwise the backward castes would have registered larger gain in their nutritional status from food supplementation.

The sooner we realise the grave consequences of ignoring this human variation and adaptation, for a secular country that we are the better it will be for us. Otherwise we are apt to brush the problem under the carpet and continue the institutionalised program of feeding children as if it were cost effective when in fact there is considerable evidence to show that intervention has failed everywhere. Clearly much more than food is involved in preventing malnutrition and the sooner we realise it, the better it will be for us all.

2. *Concepts, Methodology and Measurement in the Analysis of Poverty*

Padam Singh[*]

Removal of poverty and improvement in the standard of living have remained basic objectives of Indian Planning. These are being achieved through planned economic growth and target oriented poverty alleviation programmes for the poor. The concept of poverty line serves two useful purposes. *(i)* The concept is used for estimation of percentage and number of persons below poverty line. This is needed to know whether the planned strategies have resulted into desired change and to know the magnitude of the problem so as to fix the targets of poverty reduction and allocation of funds for the same. *(ii)* In identifying the beneficiaries of the programmes specifically planned for the poor.

Ideally, in defining the poverty line all basic (or minimum) needs should be considered. Food is the basic of all basic needs. To start with, therefore, in the definition of poverty line minimum level of food (in terms of requirement of calorie etc.) has so far remained the main consideration. That is why the definition of poverty line is linked to calorie norm.

There are number of organisations which have collected information on nutrition and related aspects (directly or indirectly) through surveys. Important among these are National Nutrition Monitoring Bureau, (National Institute of Nutrition) Hyderabad,

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National Sample Survey Organisation (NSSO), New Delhi. This paper presents the broad trends in nutritional status as revealed by these sources. The issues relating to the concept and measurement of poverty and identification of the poor are also highlighted in the paper.

The Task Force on Minimum Needs and Effective consumption Demand constituted by the Planning Commission (1979) defined the poverty line as the per capita monthly expenditure of Rs. 49.09 in rural areas and Rs. 56.64 in urban areas at 1973-74 prices corresponding to the per capita daily calorie requirements of 2400 in rural areas and 2100 in urban areas. This concept of poverty line was used for the first time by planning commission for the Sixth Five Year Plan and the same continued for the Seventh Five Year Plan. The poverty line defined this way covers the expenditure on food and non-food items and ensures the adequacy of calorie consumption. The poverty line is updated using the implicit CSO private consumption deflator as proxy for price rise in the consumption basket of the persons near the poverty line. The updated poverty line for 1977-78, 1983-84 and 1987-88 are Rs. 60.6, Rs. 101.8 and Rs. 131.8 for rural and Rs. 69.9, Rs. 117.5 and Rs 152.1 for urban areas.

The analysis of nutritional status over time utilising the data of various sources collected independently provide evidence that nutritional status in India has improved over time. It may be mentioned here that the data source considered relate to different periods and, therefore, are not expected to provide exactly the same results. Also, there are differences in the method of data collection, sample size, coverage and methodology of estimation, still, the broad trend shown by these data are in the same direction, although there are differences in the magnitudes. It is, worthwhile mentioning that in the paper by Prof. Minhas *et al.* on estimates of poverty, a decline trend in poverty has been reported, although there are differences in the magnitudes of poverty and the level of decline as compared to those by Planning Commission. Further, by utilising the data on per capita availability of food over time and converting them into calories, it has also been found that the per capita calorie consumption has increased over time.

The paper suggests that in view of economic development where the requirement of food is almost met (within the limitations of purchasing power), the definition of poverty line which is based on calorie requirement norm should include minimum levels of clothing, housing, education and medical facilities also. After

ensuring these, after some time, all the minimum needs could be considered in the definition of poverty line.

As to the estimation of the percentage of persons below poverty line, the question of pro-rata adjustment of NSS distribution should be examined afresh. Some specific studies may be undertaken to find out the extent of under/over estimation on various items by the persons in different expenditure groups.

In deciding about the cut off for identification of poor, the level should be around 3/4 of the poverty line in monetary terms as used by the Planning Commision. However, the identification of poor mainly in terms of household income, as being used, has many limitations. Firstly, there are no ways of verifying the income of a person especially in rural areas, and secondly, since benefits are linked with this, it can easily be manipulated. Instead some other factors may be considered for identification of poor. These factors could be the size of the holding, occupation status, number of persons in the family, caste, assets etc. In fact probability models may be worked out for assigning probability for persons belonging to a particular caste, owning certain land and assets, engaged in specific occupation, being poor. The probabilities could be used in the identification of poor as an alternative to what is being used mainly with the reported income as the basis. Before this is put in practice, some studies have to be undertaken to validate the same.

Number of programmes and strategies have been implemented by the Government for benefits of the poor and raising them above the poverty line. In order to assess the impact of these programmes, data may be collected longitudinally using successive sampling approach to find out the improvement in income and the nutritional status of the households. Such data could be used for assessing the contribution of government efforts in raising them above poverty line. The contribution of households as their own in raising them above poverty line could also be isolated and integrated in modifying the approach and framing strategies for poverty alleviation by the government.

3. Relationship Between Agricultural Productivity and Poverty
M.S. Bhatia[*]

There have been considerable studies about the causal relationship between the incidence of poverty and agricultural

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growth. The most quoted studies of montek ahluwalia suggest that there was discernible trend between the mid 1950s and early 1970s in the incidence of poverty in rural India but improved agricultural performance measured as an increase in net domestic product in agriculture per head of rural population was definitely associated with reduced incidence of rural poverty. These studies showed a fairly strong evidence of an inverse relationship between agricultural income per head and the incidence of rural poverty. Dharam Narain has observed that besides agricultural production and time trend, the price of food has a significant positive relation with incidence of poverty. He used time series data to show that lower agricultural prices and increased agricultural production tend to reduce rural poverty. A study on determinants or rural poverty has shown that technological change that increases agricultural production is essential to improve the incomes of the poor. Further increase in agricultural employment consequent to new production technology can reduce rural poverty. There is also a view that the decline in rural poverty ratio is the combined result of growth achieved, especially in agriculture and the implementation of various poverty alleviation programmes. A study on changes in the incidence of rural poverty has indicated that the decline in the incidence of poverty across the states does not show a pattern which can be meaningfully related to growth rates in agricultural production. In identifying/analysing the inter state differences in rural poverty in India, prices of cereals, production in agriculture sector and landlessness were the three important explanatory variables underlying inter-state differences in rural poverty.

Further, the views have also been expressed that agricultural growth as denoted by increase in production/productivity should not be seen in isolation, but its overall impact on rural employment as reflected by wage rate is important in influencing rural poverty ratio. All these studies, although, have shown some relationship between agricultural growth and rural poverty ratio but the degree of linkages have been varying. Moreover, the pattern of agricultural growth particularly in eighties is different from earlier decades in the since that in recent period, the entire increase in production has come from growth in productivity rather than expansion in area. It is, therefore, considered essential to have a fresh look in linkages between agricultural growth and rural poverty in the Indian perspective. This paper explores how agricultural growth over the years has helped in alleviation of poverty within the frame of regional statewise variation in India.

In order to establish linkage between agriculture and rural poverty, besides simple tabular analysis of data, poverty ratio functions were fitted with rural poverty ratio in percent as the dependent variable and index of agricultural (crop) production, index of crop yield, gross domestic product from agriculture per hectare in Rs., agricultural wage rates in Rs., share of agriculture in gross domestic product in percent as explanatory variables. Data on poverty ratio were taken mostly as published by the Planning Commission and on other variables from various official publications of the Ministry of Agriculture. Both time series and cross section data were used to fit the poverty functions. Time series data were used to fit the poverty ratio functions for the All India and selected four states. Time series data on wage rates for different states was however, converted to real wage rate by deflating them by suitable price index. Cross section data at the state level for 1987-88 was used to fit poverty function to explain variability in state/regional framework.

The results of poverty functions show that growth in production, productivity and per hectare gross domestic product from agriculture all have significant inverse relationship with rural poverty ratio. Increase in these factors have significantly reduced the rural poverty ratio in the country over years. However, of these factors per hectare gross domestic product from agriculture has highest explanatory power for variation in rural poverty ratio as coeffient of multiple determinants (R^2) for this function was as high as 0.6798 as compared to that for crop productivity and crop production as 0.6514 and 0.6246 respectively. However, per hectare gross domestic product from agriculture along with agricultural wage rate together explained bulk of the variability in rural poverty ratio at all India level as coefficient of multiple determination for this function was as high as 0.9580. Both of the factors per hectare gross domestic product from agriculture and real wage of agricultural labour have shown significant negative coefficients and this shows an inverse relationship with rural poverty ratio. The addition of per cent share of agriculture in the total gross domestic product as one of the explanatory factors, although marginally improved the explanatory power of the rural poverty function with R^2 as 0.9612 has not significantly influenced the rural poverty. The positive sign of the coefficient, however shows that higher the share of agriculture in GDP, higher is the rural poverty ratio. This shows that faster growth of non-agriculture sector would reduce the rural poverty ratio but not to significant level in the absence of agricultural growth.

The All India rural poverty ratio functions based on cross section data of different states for 1987-88 revealed that per hectare gross state domestic product from agriculture, agricultural wage rate and average size of holding all have inverse relationship with rural poverty ratio. The coefficients for gross state domestic product and size of holding were significant at 90 per cent level of significance whereas coefficient for wage rate of agricultural workers was significant at 99 per cent level of significance. These three factors together explained 79.7 per cent of the variability in rural poverty ratio in different states as coefficients of the multiple determination (R^2) was estimated as 0.7968. However, two factors per hectare gross domestic product from agriculture and wage rate for agricultural workers itself explained 76.48 per cent of the statewise variability in rural poverty ratio.

The increase in per hectare gross domestic product from agriculture has resulted significant decrease in rural poverty ratio in the country. The reduction in rural poverty ratio is further increased significantly with the increase in real wages of agricultural labourers which form a sizable proportion of rural population. However, increase in real wage of agricultural labourers is significantly and positively correlated with growth in per hectare gross domestic product from agriculture. The positive correlation between rural poverty ratio and per cent share of agriculture in the total gross domestic product show the importance of faster development of non-agriculture sector for further reduction in rural poverty. These analyses clearly bring out the strong linkages between agricultural growth and rural poverty ratio and show that sharp decrease in rural poverty ratio would be possible only if per hectare state domestic product from agriculture is raised significantly and benefit of this growth is also passed on to the agricultural labourers through increases in real wage rates.

4. *Data Needs for Monitoring and Evaluation of Poverty Alleviation Programmes at Micro Level*

Prem Narain[*] and Shivtar Singh[o]

Official estimates of percentage of persons below the poverty line are provided by the Planning Commission at the state level. However, with an increasing trend in decentralized planning, these estimates are required for select groups of people (small and marginal farmers, landless labourers, and socially backward

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classes) for formulating and implementing projects of special benefit to them. Extent of poverty according to size of household of holding would be needed for identification of the beneficiary groups as also for inter and intra group comparisons.

. The present thinking in the formulation of agricultural policy is also changing and it is not merely to maximize the production or productivity or for that matter to provide raw material for the industries but, what is equally important, is to develop agricultural technology for providing adequate rural employment. Particular emphasis has to be laid on the small and marginal farmers possessing tiny holdings and landless agricultural labourers who have hardly any means of sustenance. Thus other avenues of the employment like dairy, piggery, poultry, pisciculture, cottage and agro-based industry, etc. would have to be explored so as to reduce the seasonality of employment associated with arable farming. This would again entail collection of relevant data at microlevel on employment and income generating vocations in different fields.

Further data are needed for assessing the impact of beneficiary oriented Integrated Rural Development Programme (IRDP) launched during the Sixth Plan for the benefit of families with income lower than the poverty line and Jawahar Rojgar Yojana for alleviation of the poverty. This calls for collection of primary data through well planned repeat surveys and creation of data bases at the micro level through computer application. The computer is of particular relevance for agricultural statistics which involves collection of large body of data requiring complex and indepth analysis. The power of computer has increased manifold with its ability to store large mass of data in this memory which can be directly accessed and processed. With the development of mini computers and micro computers commonly known as personal computers this facility can be used in agricultural sector to a great advantage by setting up or creating computer units at district or block level all over the country. Data on various aspects of agricultural activities can be stored and maintained in these units in a readily available form. These computer units can be interlinked with a central computer facility which would provide easy communication facility for transfer of data and their dissemination. Another important use of such computer network would be to prepare comparable data sets in different fields of agriculture so as to provide easy access to any organisation or even individual research workers throughout the country.

In sum, we stress that massive data at village level generated through censuses should be transferred to floppies in the first instance. Specific softwares may be developed for analysing data on

computers to obtain reliable statistics at any desired micro level for identifying the target groups and implementing the poverty alleviation programmes. In addition, there is an urgent need for conducting repeat sample surveys on continual basis to study impact of rural development programmes on the rural poor by an agency other than the implementing one.

5. *Poverty and Agriculture, Issues and Problems of Measurement*
K.C. Seal[*] and P.C. Bansil[□]

The paper critically examines the conceptual issues, problems of measurements of poverty and limitations of the poverty ratio. It is stressed that the methodology adopted by the Planning Commision for estimating the level and trend of poverty ratio in different years of the plan period on the basis of some consumption sub-model needs further refinement. Some modification is also needed for arriving at acceptable estimates of poverty ratio based on available data on consumption expenditure from NSSO surveys and CSO national accounts statistics. It will, therefore, be hazardous to offer any comment on the trend of the poverty ratio in recent years. The problem has become more complex on account of the new economic policy adopted by the Government. To examine these questions in depth an expert committee was et up recently under the Chairmanship of Prof. D.T. Lakdawala. The recommendations of the Committee are expected very shortly. Any further comments on measurement of poverty ratio in the country should await the publications of the Report of Lakdawala Committee. However, the authors highlight two important issues :

One – income, food consumption and nutrition do not have one-to-one relation. Unless comprehensive field studies on scientific lines are taken up we will not be above to refine our tools further even with regard to various parameters which constitute poverty.

Second, it might serve as a poor consolation to the politician if under one or the other definition, the 'number of poor' is less than stipulated earlier. Similarly it might add a feather in the cap of a researcher and a handle for an opposition leader if he/she can prove that this number has gone up. But the taste of the pudding as one would say lies in the eating. What is the real ground situation? How far these complicated refinements would help the village functionary to provide assistance to those who really need it, is the crucial issue.

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Added to all this is the need for a change in the attitude of bureaucracy, poverty alleviation programmes need to be taken out of the realm of politics or even officialdom. Otherwise all our discussions might remain as futile exercises and only paper tigers.

As a part of monitoring progress achieved towards reduction in poverty ratio in the country (currently being done by the Planning Commission) we felt that it will be more appropriate if a close watch is kept on the total level of living of the most vulnerable section of our population belonging to each of the relatively homogeneous agro–socio–economic sub–regions of our country as worked out by the Planning Commission. It is felt that improvement/deterioration in the total level of living as well as its major components in respect of the poorest segment of the sub-regional population will normally be positively correlated with the living conditions of other poor people. Changes observed for the poorest segment of population directly at periodic intervals through personal visits of trained field investigators would provide a more dependable data base on the progress being achieved in the poverty alleviation programme in different parts of the country.

In this context we share by and large, the views of Scotut and Mathew that poverty should be expressed in terms of a small number of indicators most of them should preferably be non-monetary and easily discernible by trained field investigators visiting the sample households. The socio–economic indicators should cover all the principal components of levels of living. It is crucial that periodic sample surveys are carried out in an objective manner at least once in 5 years for this purpose. It might be desirable to entrust this task to a suitable non- government organisation who should be provided with full technical support from professional government organisation like NSSO, CSO, etc.

At the same time, the more important aspect of all these deliberations/exercises is effectiveness of these norms and procedures while implementing them at the village level. In the light of our field observations made in this paper, all our refinements will not be of much value and would tend to remain only at the theoretical level, unless immediate steps are taken to rectify the field problems associated with particularly in the rural areas.

6. Agricultural Productivity and Farm Poverty in Orissa
Dibakar Naik[*] and Rina Mishra[□]

The authors attempt to examine the effect of agricultural productivity on farm poverty in different districts of Orissa, using the concept of break-even holding size – a size of holding producing certain amount of output giving a net income which just covers necessary living expenses without saving.

As the data on average income per hectare for Orissa was available only for the year 1985–86, the break-even holding size at poverty line for different districts of Orissa for the years 1985-86 and 1989-90 were calculated using the productivity data for the years 1985-86 and 1989-90 and per hectare income for the year 1985-86 of Orissa.

The break-even holding size to earn a net income of Rs. 6400 per annum per family consisting of 4 to 5 adult members varied from 1.45 hectares (Sambalpur) to 2.19 hectares (kalahandi) during 1985-86. The lowest break even holding size was 1.27 hectares both for Cuttack and Sambalpur districts while the highest size of holding matching the poverty line was 2.19 hectares for Kalahandi district during 1989-90. The break-even holding size for kalahandi district remained stagnant during 1985-86 and 1989-90. It was mainly due to stagnancy in foodgrain productivity. Further, the break-even holding size has increased in Koraput, Phulbani and Sundargarh in 1989-90 as compared to 1985-86 due to decline in productivity in the district during the period.

7. Poverty and Agriculture in Andhra Pradesh
C.S. Rao[+], A.S.R. Prasad[+], A.V. Rao[+] and A. Somasekher[+]

Poverty as an absolute value among rural population has been increasing in India though production of foodgrains has grown faster than population. This paper highlights poverty as associated with agriculture among rural people of Andhra Pradesh with specific reference to different social groups.

Specifically, various poverty alleviation measures especially afforestation, productivity of land through irrigation, technological innovations and provision of mass employment in agriculture sector are highlighted in the study. Analysis and discussion of empirical

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time series data reveal the need for determining poverty lines for different social/occupational groups based on population explosion, agricultural production, consumption levels and nutritional requirements besides minimum basic needs. Land as an instrument of poverty alleviation is examined for its redistribution and increasing the productivity and production. The optimum size of holding plays a vital role for poverty alleviation. Further, the profit from land (consumer's purchase price – cost of production) is not distributed equitably among labourers, cultivators, millers and traders etc. Besides institutional arrangement for increasing agricultural production, the net-work of distribution system in the rural setting has been discussed to aim at improving economic conditions of the disadvantaged groups.

It is observed that the Integrated Rural Development Programmes which are mainly meant for poverty alleviation have no significant impact on the economic conditions of the rural poor especially the disadvantaged. The study further highlights that effective implementation of family planning is the first and the foremost step in poverty alleviation. These long term measures are a prerequisite for the sustainable development and for poverty alleviation besides the intensive implementation of Integrated Rural Development Programmes.