

**SYMPOSIUM ON
"REGIONAL IMBALANCES AND ECONOMIC
DEVELOPMENT WITH SPECIAL REFERENCE TO
AGRICULTURE"**

Chairman: SHRI K. RAMAMURTHY.¹ I.A.S.

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The symposium was held at the 30th Annual Conference of the Society at Bhubaneswar (Orissa) on 30th December, 1976. It was presided over by Shri K. Ramamurthy, I. A. S., Agricultural Production, Commissioner, Government of Orissa. After the introductory remarks of the Chairman, the participants presented their papers. In all, seven papers were presented at the Symposium.

Dr. D. P. Singh, the then Chairman, National Seeds Corporation. Shri Prithpal Singh, Directorate of Economics and Statistics, Govt. of India, Mrs. Barathakur, Bureau of Economic and Statistics, Arunachal Pradesh, participated in the discussions. Detailed summaries of the papers presented are given in the following pages.

**Regional Imbalances and Economic Development with Special
Reference to Agriculture**

By P. S. Sharma: *Planning Commission, New Delhi*

The growth impulses for activating the process of development in the regions, were different. In certain regions, development could emerge due to growth impulses originating in the agriculture sector or agro-based industry sector. In certain other regions, these impulses could emerge from highly capital intensive industries. In still other regions, all these factors would simultaneously operate.

In defining the term "region", it was highlighted that in the context of agricultural regions, the relevant indicators could be

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growth rates in the output of major crops, commercialisation of agriculture and the associated surplus generating capacity; dependence of working force on agriculture; distribution of productive gains among different segments of the society; level and pattern of consumption of quality inputs and the development of surface and ground water resources.

Foodgrains play a pivotal role in the agricultural development. The growth of output of foodgrains was studied for each of the major States and the relative role of expansion of area and expansion of yield rate in achieving the growth rate in output was highlighted. On the basis of Statewise analysis, it was pointed out that the pattern of growth in agriculture in States like Punjab, Haryana and Western U. P. was sharply different from the pattern of development observed in the Eastern region of West Bengal, Orissa and Bihar. The States like Maharashtra stand in a class by itself in the sense that while the consumption of inputs has tended to increase, the output of several crops has shown declining trend. The level of agricultural development for various districts for the triennium 1970-71 to 1972-73 had been studied so as to highlight that in the early seventies per hectare gross value of output (19 crops) was above Rs. 1500 in 15% of the gross cropped area. Per hectare gross value of output was less than Rs. 1000 per annum in 60% of the gross cropped area. Examining the development during the triennium ending in 1972-73 over the triennium ending in 1964-65, it was observed that only 14% of the gross cropped area showed a growth rate of 5% and above. In another 30% of the gross cropped area, the growth rate had been between 3% and 5%. In another 31% of the area, it varied between 1% and 2.99%. The remaining 25% of the area showed a growth rate of less than 1%.

The level of agricultural output and agricultural growth could also be studied in terms of structural and institutional variables. The surveys conducted by the Reserve Bank of India have shown that of the total value of assets in a rural household, on an average, land accounts for about two-thirds of the total. Thus, assets inequality in the rural areas could be explained in terms of land inequality. If we compare the pattern of land distribution in the rural areas in 1961 and 1971, it is observed that land concentration has decreased in Kerala and West Bengal and to some extent in Maharashtra. In other States, land inequality has either remained constant or has increased. One of the basic features of land distribution as reflected by 1971 agricultural census is that at all India level, 51% of the holdings are marginal (less than 1 hectare) and account for only 9% of

the total. As against this, 4% of the households at the top account for 31% of the area. It is this imbalance in the distribution of land among households in various regions that might explain the regional imbalance in agricultural development. A regional study on the relationship between land inequality and per acre gross productivity (20 crops) has shown that in the permanent settlement areas of Bengal, Bihar and Orissa around 1960-61, an increase in land inequality tended to decrease productivity.

In view of the variations in the levels of agricultural development in various regions and the regional diversity of resource endowments, it is risky to recommend any particular policy variable for the removal of regional imbalance.

The highest priority should go to the building up of resource inventory for each of the various regions down to the micro level. It was pointed out that vast areas of the country have not yet been covered by geological surveys. Allocation of funds for systematic evaluation of ground water resources has to be given considerable importance. With the collection of more information, it should be possible to develop a detailed land utilization plan and a coordinated plan for the utilization of surface and ground water. The development of irrigation and expansion of inputs associated with it will have a vital bearing on increasing the level of output and the generation of employment potential in the rural sector. The agro-based industries and cottage industries should be given pride of place in removing the regional imbalance. The development of hill-areas and tribal areas as also the areas inhabited by weaker sections has to be studied separately and appropriate planning strategy laid.

In short, the various ecological and structural constraints that are inhibiting the growth need to be first corrected and thereafter attempt should be made to adapt productive activities of different regions to the natural endowments. This would imply discriminative use of policy instruments like giving of incentives to industrial development, employment generation programmes and special programmes like horticulture in hill areas, animal husbandry in desert areas and promotion of agricultural extension, marketing and setting up of agro-based industries.

Factors contributing to regional variations in productivity and adoption of high yielding varieties of major cereals in India

By S.K. Raheja, P.C. Mehrotra, A.K. Banerjee, V.S. Rustogi and S.S. Gupta.

Institute of Agricultural Research Statistics, New Delhi-12.

The regional variations in adoption of high yielding varieties and their productivity were studied with the help of data collected under the scheme 'Sample surveys for assessment of high yielding varieties programme' during 1973-74 covering 88 districts spread over 15 States of the country. Four aspects were considered (a) yield, area and main varieties in different agro-climatic zones (b) area benefited by fertilizers and average rates of their application (c) use of irrigation and plant production chemical and (d) credit availability and its utilisation. The study was undertaken for the two major cereals viz., rice and wheat.

For rice crop it was observed that the extent of adoption of *HYV* in different regions had no direct bearing with their yield rate since even in a State like Karnataka with the highest yield rate, less than 30 per cent of the area was cultivated with *HYV* while in other non-traditional States like Punjab the coverage was the largest being about 81 per cent. For wheat crop the proportion of area under *HYV* was generally much larger in the traditionally wheat growing States compared to the non-traditional States with the exception of West Bengal, where the proportion of *HYV* area as also the yield rate compared fairly well with the traditional wheat growing States like Punjab and Madhya Pradesh. The low yield rate in some of the traditional wheat growing areas like Haryana and Uttar Pradesh could be on account of adverse climatic factors prevailing during the year.

The main factors governing the extent of adoption of *HYV* apart from fertilizer use, are the local conditions including climate, water supply and the agronomic and management practices. The area benefited by the application of chemical fertilizer namely *N*, *P*, *K* which are essential nutrients for growing *HYV*, varied considerably from region to region. Even though *N* was applied to more than 90 per cent of the area for both rice and wheat in most of the regions, the rate of its application was highly variable. In the case of *P* and *K* the levels of application were fairly stable. The variability in the average yield from region to region therefore arises more from the extent of fertilizer use rather than their doses.

For rice crop the moisture index did not show much association with the extent of cultivation of *HYV* or the average yield in a number of regions mainly on account of supplemental irrigation facilities available in these regions. In case of wheat crop the percentage of holdings having irrigation facilities was fairly high in most of the regions. However, the moisture index was negative in all the regions indicating inadequate rainfall although yield rate was not seriously affected on account of availability of assured water supply through supplemental irrigation.

It was observed that in the regions where the percentage of rice cultivators availing credit facilities was low, the amount borrowed per borrowing cultivator was also low, leading to the conclusion that the credit worthiness of the farmer is a crucial factor in credit availability.

The regional variations were thus more marked in the case of rice crop compared to wheat crop mainly on account of lack of assured water supply and resource endowments of the cultivators. The yield rate is highly variable in the rice regions compared to wheat and the credit utilisation is also less for rice cultivators. The imbalance in the average yield of *HYV* did not show much association with *HYV* adoption rate, the regions with high *HYV* average yield showing low coverage under *HYV* and *vice versa* in a number of cases. Apparently proper water management and timely supply of important production inputs either by supply of credit or otherwise would narrow the gap considerably.

Crop Productivity Variation in India

By D. Singh, R.K. Pandey and Vimal Kishore, I.A.R.S., New Delhi.

Increase in the crop output per unit of land is an important indicator of development in agricultural sector. During the recent years a considerable attention has been given to agricultural researches leading to increase in the yield of crops. Crop yield per unit of land among other things, is influenced by the application of factors of production, better management technique and physical factors *e.g.*, soil type, topography, weather, rainfall etc. Crop yields rose by 12.5 per cent during the period 1950-51 to 1960-61. This increase was 14.7 per cent during 1960-61 to 1970-71. The ranking of States in the terms of crop yield has varied considerably over a period of twenty years.

The present study is devoted for the study of variation in the crop yield and some of the selected inputs *e.g.*, fertilizer, gross irrigated area, and area sown more than once for various States. As far as crop yields are concerned, the States of West Bengal, Kerala and Assam were in the forefront during 1950-51. The other States placed in the descending order were J. & K., Tamil Nadu, U.P., Andhra Pradesh, Punjab (combined) and Orissa. The States of Madhya Pradesh, Gujarat and Maharashtra and Rajasthan were at the bottom of the list. The position was different in the years 1960-61 and 1970-71. The State of West Bengal, showing maximum yield in 1950-51, occupied fifth position in 1960-61 and fourth position in 1970-71. Kerala State showed highest yield in 1960-61 but again became number two in 1970-71. The yield in case of Punjab and Haryana (combined) showed continuous improvement and its position improved in 1960-61 to sixth and in the year 1970-71 its ranking was first. The State of Orissa was ninth in 1950-51. It became 14 and 12 in the years 1960-61 and 1970-71 respectively. Rajasthan occupied the last position in all the selected years. The States of Gujarat, Maharashtra and M.P. also remained at the end of the list.

Inter-relationship among yield of foodgrain and various inputs *e.g.*, application of fertilizer, proportion of area sown more than once, and gross area irrigated might be high.

The relative position of various States in terms of fertilizer use in Kilogram on per hectare basis was studied for the years 1960-61, 1965-66 and 1970-71. State of Tamil Nadu remained on top during 1960-61 and 1965-66. The first rank went to Punjab during the year 1970-71. Kerala remained at second position during 1960-61 and 1965-66. But its position became fifth during 1970-71. U.P. remained fourth during 1960-61 and 1970-71 but seventh during 1965-66. West Bengal was fifth in the first period but went down to the ninth position during 1970-71. Orissa remained eleventh during 1960-61 and twelfth in 1970-71. Rajasthan and Madhya Pradesh remained at the bottom in all periods.

In terms of gross irrigated area during 1950-51, Punjab (combined) was at the first place followed by Andhra Pradesh, Tamil Nadu, U.P. and West Bengal. States at the end of the list were J. & K., M.P., Gujarat and Maharashtra and Rajasthan. During the year 1970-71 the State of Punjab again occupied the first place. Other important States were Tamil Nadu, U.P. and A.P., Bihar was at tenth position during 1950-51. It became fifth during 1970-71. M.P. remained fourteenth during all the three periods.

Intensity of cropping also differed during the period under study (*i.e.*, 1950-51, 1960-61 and 1970-71). It was maximum in H.P. during all the selected years. U.P. was next in the first two periods but became fourth in 1970-71. State of Punjab was at the third place during 1950-51 and 1960-61 but became second in 1970-71. The States showing low intensity were Andhra Pradesh and Rajasthan. The relative position of Orissa became fifth in 1970-71.

Regional Disparity in Agricultural Production : Relevance for Policy

By Sudhin K. Mukhopadhyay,
University of Kalyani, West Bengal.

Agricultural policy in developing economies has usually two major objectives : (i) increase in output and (ii) reduction in regional disparity. While output at the aggregate level has generally shown a positive response to policy measures, the second objective has been evading the policy makers. It is not uncommon to experience even a trade off between the two objectives, regional disparity to expand with agricultural development. This has happened in the face of simplistic solutions recommended in various studies on agricultural bulk of the disparity. Such studies often come up with results that attribute bulk of the disparity to differences in factor inputs, *e.g.* extent of irrigation or use of fertilizer, differences in crop composition, difference in factor endowments, etc. The implication is that policies designed to reduce such differences should succeed in controlling regional disparity. The contention of this note is that such propositions are based upon an inaccurate specification and inadequate perception of the complex nature of the problem and so the core of it remains untouched by policy. It is argued here that regional disparity is inherent in the very nature of agricultural production which uses inputs of highly region-specific characteristics. Agriculture in this respect is in sharp contrast with industrial production whose inputs are much more mobile across regions. Conventional analysis ignores this aspect of agricultural production and tends to overestimate the effects of such inputs as are measurable and amenable to short run policy instruments. Besides, the concept of region is not clearly and scientifically specified, often leading to the treatment of heterogeneous regions being subjected to comparison under the same criteria. Comparison is legitimate only among regions that are agro-climatically and crop-wise homogeneous. It is also necessary to measure outputs and inputs so that they mean the same thing across regions. Moreover, the effect of

weather factors that varies from region to region and time to time has to be eliminated in order to arrive at pure region effects.

It is hypothesized here that when problems of specification and measurement are taken into account, the difference in the levels of agricultural output between two regional units in a given time period can be decomposed into three components :

- (i) Input Effect.
- (ii) Region Effect.
- (iii) Temporal Effect.

Regional disparity in agriculture should be studied in a space-time context where it is possible to identify the three sets of factors mentioned above. Assuming that the relationship between inputs and outputs can be expressed in the form of a Cobb-Douglas type production function, such a function can be fitted to time-series of cross-sections data following a method that can generate estimates of the Input Effect, Region Effect and Temporal Effect.

The method has been discussed in the paper and illustrated with the examples.

Fitted over 72 districts of the Punjab-Haryana-U.P.-Rajasthan-M.P. wheat regions over 10 years 1959-60 to 1968-69, the production function shows that measured inputs (land, irrigation, fertilizer, labour, machinery and education) explain only about one-fifth of the variation in output over space and time, the bulk of the variation being due to region-specific time-invariant factors not captured in the measured inputs. For example, it appears that Ludhiana has a region effect so high that with *identical quality and quality of inputs* and under *identical weather* conditions it could produce about five times the average output level for the entire region. This indicates that simple regional policies via allocation of measured inputs cannot generally be expected to yield spectacular success. For that it is necessary to influence the region effects, which is a time consuming process.

Some Studies on Regional Imbalance in Livestock Development

By D. Singh and K.C. Raut,
Institute of Agricultural Research Statistics, New Delhi.

According to the quinquennial livestock census, 1972 cattle constitutes about three-fourths and buffaloes one-fourth of total bovines in the country. This ratio of cattle and buffaloes is not observed in all the regions in the country. The proportions of cattle and buffaloes under various classifications differ and also the level of milk production, nutritional status of animals, per capital availability of milk and other related aspects. There are some indicators to show the imbalance in livestock development in different regions and also over time in a region. The paper discusses some of these aspects.

Of the 236.8 million bovines in the country, 178.9 million are cattle and 57.9 million buffaloes. Whereas more than 90% of bovines are cattle in states of Assam and West Bengal, it is less than 50% in Haryana and Punjab. Adult males are more than adult females in all the states excepting in Kerala, Rajasthan and Jammu & Kashmir. In the case of buffaloes adult females preedominate in the country. This trend is observed in all the States excepting in Kerala, Jammu & Kashmir, West Bengal and Orissa where male buffaloes are proportionately more.

There was an increase of 13.1% of buffalo population from 1961 to 1972 as compared to only 1.9% increase in cattle population. Although there was overall increase in cattle and buffalo population for the country as a whole, actually there was decrease in cattle population in Assam, Bihar, Gujarat, Maharashtra, Punjab, Rajasthan, Tamil Nadu and U.P. but in the case of buffaloes the decrease was in Bihar, Kerala and West Bengal.

Of the 5.1 million adult female cattle which did not calve even once, Orissa accounted for 15.4%, Andhra Pradesh 11.8%, U.P. 11.7% and Maharashtra 10.3%. Of the 2.3 million such buffaloes in the country, U.P., Andhra Pradesh and Rajasthan accounted for 23.3%, 16.2% and 11.1% respectively. The number of adult females not calved even once is steadily decreasing in most of the States although the rate of decrease differs.

According to the last census, there are about 2.4 million cattle and half a million buffaloes which are not in use either for breeding or work. Tamil Nadu accounts for 18.7% of cattle under this cate-

gory, Andhra Pradesh 13.5% and Karnataka 12.9%. In the case of buffaloes, 20.7% are in Andhra Pradesh under this category.

It was worked out that on an average, one pair of draught animals was being utilised for 4 hectares of cropped area. It varied from 1.8 hectares to 10.2 hectares per pair in different States.

About 5.5 hectares of grazing area are available per 100 bovines in the country as whole. In the States of Punjab, Haryana, Kerala and U.P. less than one hectare of grazing area is available for 100 bovines.

Whereas the number of bovines per veterinary hospital and dispensary was worked to be about 12 thousand in U.P., 13 thousand in Punjab, 17 thousand in Haryana and M.P., it was as high as 32 thousand in West Bengal and 34 thousand in Orissa.

The proportion of milch stock was worked out to be 134 per 1000 persons in the country as a whole. The number is only 51 in Kerala, 77 in West Bengal as compared to 243 in Rajasthan and 211 in Punjab. It was examined that the higher proportion of buffaloes was better indicator of higher per capita availability of milk.

There is considerable disparity in milk production in different States. The average daily milk yield of a cow in milk was estimated to be about 2.5 kg in Punjab & Haryana as compared to only half a kg in Madhya Pradesh. Similarly, the milk yield of a buffalo in milk was more than 4 kg per day in Punjab, Haryana, Western U.P. but only about 1 kg in Orissa. Punjab and Haryana being the home tract for Haryana cows and Murrah buffaloes, the level of milk production is higher in these areas. In Rajasthan and Western U.P. which are adjoining Punjab and Haryana, the level of production of both cows and buffaloes is comparatively higher.

Whereas the per capita per day availability of milk in 1972 was estimated to be about 464 gms. in Punjab, 386 gms. in Haryana, 330 gms. in Rajasthan, it was only about 150 gms. in U.P., 94 gms. in Maharashtra and M.P., 62 gms. in Tamil Nadu and 48 gms. in Orissa. The main reason for higher per capita availability of milk in Punjab and Haryana was due to higher proportion of milch buffaloes and higher productivity of milch stock as compared to other areas.

Factors Affecting Regional Economic Growth with Special Reference to Orissa

By P. N. Das, *Bureau of Statistics and Economics, Orissa.*

Regional imbalance in economic development and particularly its increasing trend of disparity in the levels of growth between the regions owes itself to a variety of factors.

The gap between the national per capita income and the State per capita income is a readily available yardstick in the measurement of regional imbalance. In case of Orissa, this gap instead of narrowing down has become wider, from Rs. 99 in 1960-61 to Rs. 134 in 1971-72 and to Rs. 162 in 1973-74. Inter-State disparity in per capita net State domestic product is still more revealing. The comparable estimates for the triennium 1970-71 to 1972-73, show that Punjab with a per capita income of Rs. 1106 leads the States, followed respectively by Haryana with a per capita income of Rs. 974, Gujarat Rs. 808, Maharashtra Rs. 799 and West Bengal Rs. 786. Orissa with Rs. 566 ranks only 13th among the States.

Regional distribution of income in India on the basis of above data would reveal that the Western region is the most developed region (per capita income Rs. 803) followed by northern region (Rs. 713) with the southern region being third (Rs. 667) and the eastern region fourth (Rs. 600).

The fact that the eastern region contains all the major heavy industries in mineral, metallurgical and engineering sectors and yet is the most backward region, only indicates that value added by manufacture compared to these of other sectors specially the agriculture sector, is still not sizable and if the income-originating concept is replaced by the income-accruing concept and thereby excludes that part of income which does not accrue to the people of the region, then the level of disparity would be still greater in case of the eastern region. However, there is no data available to precisely estimate it. This evidently indicates that level of prosperity in agriculture sector still continues to determine the level of development of a region.

The 'new agricultural strategy' has also a built-in bias towards promotion of regional inequalities. The index number of agricultural production in India reveals that growth rate in wheat-growing regions is nearly double than that of rice growing or jawar or bajra cereal-growing areas. This is largely due to the fact that the proportion of rice areas under high-yielding variety to total rice area is insignificant, whereas the proportion of wheat area under high yielding variety to total wheat area is very substantial.

Secondly, the high yielding strains in wheat is far more improved and so the productivity rate is higher than in case of rice. During the period 1960-63 to 1970-73, productivity (kg per hectare) of wheat in Punjab has increased by 72% whereas productivity of rice has increased by 8% in Orissa and 13% in West Bengal and the highest rate of increase was only 24% in case of Tamil Nadu in the corresponding period. In case of Orissa, even in Sambalpur district, which has the benefit of assured water supply from the Hirakud irrigation system, the productivity of winter rice has increased by only 13% between 1960-63 and 1970-73. In the other two irrigated districts of Orissa, namely in Cuttack and Puri the productivity rate of winter rice has decreased by 1% and 3% respectively over the corresponding period. Assuming that high yielding strains have led to substantial increase in productivity of summer rice, the overall picture still does not improve. The two other important inputs in raising productivity, namely irrigation and fertiliser consumption are also very unevenly distributed even within the rice-zone.

The consumption of much higher proportion of fertilizer in West Bengal and Bihar are due to large scale cultivation of jute in case of West Bengal and high yielding variety of wheat in case of Bihar, whereas in Orissa whatever little fertilizer is used, it is largely confined to rice. At the national level, of late, there has been a decline in fertiliser consumption in 1974-75 over 1973-74, in spite of reduction in prices of chemical fertiliser. This, therefore, implies that elasticity of demand for consumption of fertiliser is more dependent on cropping pattern, weather condition and irrigation facilities rather than on prices of fertilisers.

Plan outlay between the regions is another vital factor in this regard. Though it is recognised that one of the reasons accounting for increasing regional disparity in economic development lies in our inability to make minimum critical level of investment for economic development in backward regions and that the growth rate per unit of investment in underdeveloped regions will continue to be lower than in developed regions due to low productivity of capital and also due to the problem of leakage of the multiplier in the under-developed areas, investment-planning is still short of that dynamism necessary to overcome the effects of these inhibiting forces.

Allocation of plan resources percolates to State's economy in three ways, *i.e.* (1) State plan outlay, (2) Central-sector plan expenditure in different states, (3) Private sector outlay. The first two components which constitute the public sector outlay are most vital

for economic development of backward States, as private capital is shy or scarce. Again within the public sector, the inter-State distribution of central sector plan investment has not been precisely worked out. However, assuming that inter-State ratios in central government employment are closely related to the inter-State distribution of central sector plan investment, it may be broadly possible to find out the inter-State shares in Central sector investment. The distribution of central government employees in different States in 1974 was worked out and discussed in the paper. Utilizing this, an estimate of per capita plan expenditure in different States was attempted for 3rd, 4th and 5th plan periods by different methods.

Moreover the estimates of per capita State plan outlay, per capita central plan outlay for the 3rd, 4th and 5th plan periods were worked out for different States and discussed in the paper.

Of all States public sector investment in Orissa has been one of the lowest in the 4th and 5th plan, though its *inter-se* position was slightly better in the 3rd plan. In terms of third plan prices, the per capita plan expenditure in Orissa was lower by 48% in the fourth plan and would be lower by 29% in the fifth plan compared to the third plan.

Certain Factors Inducing Imbalance in Economic Development of Kerala With The Rest of The Country

By P.U. Surendran, *Kerala Agricultural University, Trichur.*

Kerala is one of the smallest States of our land (38.5 thousand sq. km.) with a high density of population (548 per sq. km. in 1971). While it accounts for 3.8 per cent of the population it has only 1.3 per cent of its land area. The pressure on land is high and is progressively increasing due to population explosion. The State leads the country in literacy (60 per cent); in almost all other matters it lags behind most of the others. The paper indicates some of the factors which inhibit the economic development of the State.

With about 40 per cent of the population in the age group 0—14, 30.1 per cent of the total expenditure of the State in 1971-72 was for education. However a State like Punjab with half the percentage of literacy has a per capita income almost twice that of Kerala. The State continues to be agrarian in nature and a very major proportion of its 8.7 lakh industrial workers are engaged in traditional agro-vasal industries such as coir, cashew, beedi and handicrafts. In

these industries wages are extremely poor and employment irregular. Only 29 per cent of its labour force of 114 lakhs in 1971 had gainful employment of one hour or more per week ! Even this represents a decline from the position in 1961 (31 per cent) resulting from employment opportunities growing more slowly than population. Proportion of workers in agriculture increased from 38 per cent in 1961 to 49 per cent in 1971 which reflects an unhealthy trend.

Agriculture : The total cropped area in the State has remained almost static during the last five years. During the 12 years ending 1973-74 increase in production commensurate with increase in population is observed only in 9 out of 24 important crops. The food situation has been saved to some extent by an increase of 244 per cent in the production of tapioca of which the productivity has also improved (165 per cent). In rice the yield level of 1575 kg./hect. achieved in 1972-73 was still well below that of Punjab (2290 kg./hect.) due mainly to poor irrigation facilities in Kerala (21 per cent). In coconut the principal commercial crop of the State productivity has actually declined by 18 per cent. Impressive increases in production were recorded in respect of the commercial crops like rubber, ginger and coffee, the former two crops showing substantial improvement in productivity also.

Animal Husbandry : Majority of farmers in Kerala being small or marginal, livestock rearing will help them to increase gainful employment. Infertility of cross-bred cows, relatively low fertility rate of artificial insemination, lack of land for green fodder are major handicaps in livestock development. These notwithstanding the average annual milk yield of cow is 384 kg. in Kerala as against the all India average of 157 kg. However, the male calves are not caved for as before and are declining in numbers. If these are reared to a body weight of 250 to 400 kg. they could help to develop meat industry in the State.

Fisheries : Among the Indian States Kerala has first place in Fish production. However it represents only a fraction of the potential production. With mechanisation and modernisation of fishing the area of operation can be extended deeper into the sea. Production from inland fisheries could also be stepped up substantially.

Conclusion : For the economic development of the State high degree of industrialization is essential. Another way is by increasing productivities of land, livestock and fisheries. Productivity of land can be increased by greater cropping intensity and extension of irrigation facilities to all lands under cultivation. Productivity of

livestock can be increased by disease control, codded efficiency of artificial insemination and production of nutritious feeds at low cost; and of fisheries, by adoption of modern fishing methods and exploiting new areas.

**In His Concluding Remarks The Chairman (Shri K. Ramamurthy)
Observed as Follows :**

It is very appropriate that the Society has held the symposium on "Regional Imbalances" in the State, for Orissa is economically one of the most backward areas of the country. A number of factors have contributed to the situation. When Orissa came under the British Rule the agrarian situation in this area deteriorated as the British were interested only in the revenue coming from the State and not the welfare of its people. Their purpose was served by the introduction of Permanent Settlement but it ruined the peasantry completely. They had no interest left in the improvement of the land. It also led to fragmentation. Thus the backwardness of Orissa Agriculture has roots in History.

The coming of the green revolution has also not helped the State significantly. This area is subject to floods and characterised by environment favourable to numerous pests. No varieties of rice suitable for this area have yet become available. If rice production in Orissa has not made the kind of progress that has been made in Punjab that is attributable to the differences in environment, low rainfall and availability of irrigation in Punjab, and not to the shortcomings of our Extension. It has not been possible to introduce alternative crops also, because no other crops have been found suitable for these conditions. The problem is thus very difficult and our only hope is in the expansion of irrigation facilities. In fact much of the progress of agriculture in Punjab and Tamil Nadu may be explained by the abundant irrigation facilities available in the States.

Orissa has got a good base in minerals and manpower for industrial development. However, some of the large industrial projects established in this area have not contributed materially to the welfare of the people. The local people have not had any appreciable share in the employment opportunities except at the lower level of unskilled labour.

Development of livestock industry might be expected to contribute significantly to the economic progress of this State. One

favourable factor is the absence of controversy here regarding relative importance to be attached to cow and buffalo in dairy development. However, there was no substantial development of the dairy industry for want of land for fodder cultivation due to the population pressure on land.

The problem of economic development of Orissa is thus very difficult and the population growth has aggravated it further. We may take this as a challenge to the agricultural scientists, including the Statisticians and the Economist to apply their minds to it. I feel, holding of the symposium has stimulated the interest of the scientists in these problems.