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Vol XXIX
No. 3

ISSN 0019-5014

CONFERENCE
NUMBER

JULY-
SEPTEMBER
1974

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

INVESTMENT IN IRRIGATION PROJECTS AND ITS IMPACT ON PATTERN OF INCOME DISTRIBUTION—A CASE STUDY OF THE WEST BANAS PROJECT IN RAJASTHAN

A. S. CHARAN

*Department of Economics
South Gujarat University, Surat*

SUMMARY

In recent years, public investment has been considered a strategic variable in the development programmes of the under-developed countries. The strategies to be followed for the development of investment projects in different sectors including the agricultural sector basically are aimed at increasing the social welfare. The two primary determinants of social welfare are economic efficiency and its effect on distribution of income in the society. Thus, both these determinants have been considered important aspects of project evaluation. This paper deals with the impact of investment in irrigation projects on the pattern of income distribution. On the basis of a comparative study of income data of command and control area, it has been found out that West Banas Project has raised the level of incomes of the lowest income earning groups, thus bringing them above the poverty line. It has in all probability, decreased the income inequality in the area.

GREEN REVOLUTION — GROWTH AND INEQUALITIES IN UTTAR PRADESH

DAULAT SINGH

*Professor and Head
Division of Extension and Training*

AND

RAM IQBAL SINGH

*Professor of Agricultural Economics
Division of Agricultural Economics and Statistics
U. P. Institute of Agricultural Sciences, Kanpur-2*

SUMMARY

A new phase in Uttar Pradesh agriculture came in 1966-67 with the introduction of high-yielding, exotic and hybrid varieties of different crops. The green revolution has combined the advantages of its four components, viz., (1) agronomic revolution, (2) chemical revolution, (3) engineering revolution and (4) management revolution.

1. *Agronomic revolution* : It has been observed from the available data that wheat, paddy and bajra have proportionately contributed more towards production than their legitimate share in the increased acreage. The reduction in area of jowar is greater than its corresponding reduction in production. The proportionate increase in area under maize is greater than its corresponding contribution in production. The pace of adoption of the varieties of exotic paddy has been slower as compared to that of wheat. This is attributed to poor water management and acute disease and pest problems of the paddy strains. In the case of hybrid maize, it could not be a component of multiple cropping programme of the farmers due to its long duration, sophisticated crop technology, poor margin of profit, high investment and greater risk and uncertainty involved in its cultivation. The hybrid jowar and bajra have also failed due to their high susceptibility to the diseases and pests.

2. *Chemical Evolution* : It has been observed that per hectare use of N, P, K has increased from 4.43 kg. in 1964-65 to 20.10 kg. in 1969-70. The intensive use of fertilizers, plant protection chemicals and herbicides has made the public sceptical about soil and water pollution through these chemicals.

3. *Engineering revolution* : Mechanical wheat threshers introduced recently are being used in the State very extensively. These are produced locally with a wider range of capacity and price. Their economies are so clear that it is a question of only a few years when almost all wheat will be so processed. A number of tube-wells and pumping sets are being installed in the countryside and mechanization in irrigation device has been a perceptible change.

(4) *Management revolution* : The wisdom of the current policies is reflected in the increased use of fertilizers, improved seeds and in the fact that the institutional impediments are no longer bottlenecks to the utilization of these inputs. A silent revolution in the thinking and actions of the farmers to modernize agriculture is attributed to the farm education programmes developed and conducted by the agriculture universities, research institutes and extension training centres. The distance between the scientists and the farmers is shorter today and a free communication between them has been established.

Inequalities created : The green revolution has created several imbalances in the agricultural economy of the State. Some of the imbalances are as under :

(A) *Crop imbalance* : The new agricultural technology is irrigation biased. Farmers with assured quantity and timings of water application have adopted the dwarf wheats over larger area than those who do not have access to irrigation. Wheat is rich in carbohydrates and has replaced protein rich pulses causing protein deficiency in the State.

(B) *Regional imbalances* : The consumption of fertilizer is 23.46 kg./ha. in the western region against 3.81 kg./ha. in Bundelkhand. 43.50 per cent of the cultivated area in western Uttar Pradesh is irrigated against 4.50 per cent in the Bundelkhand region. This has caused regional differences in income and prosperity.

(C) *Socio-economic imbalance* : The new technology is neither capital intensive nor location specific. It is neutral to the size of holding but since the application of new technology heavily depends upon irrigation and fertilizer, it is biased against those farmers, large or small, who do not have access to these resources.

To sum up, the green revolution is a result of interactional effects of agronomic, chemical, engineering and management technologies. It has generated new problems for intellectuals to evolve tailor-cut time-bound socialistic strategies.

POLICY PROGRAMME FOR AGRICULTURAL DEVELOPMENT AND WELFARE AT HOME

P. C. SHUKLA

*Agro-Economic Research Centre
Allahabad*

SUMMARY

There is no doubt that the efficient use of land depends as much upon the capacity of man to treat the land and manage it, as upon the system of farming, system of tenures and unit of enterprise (size of farm). The level of production or the efficiency in the use of land is to that extent dependent upon the nature of the institutions and institutional framework within which the production function is carried out by the farmer. So the strategy of agricultural development and equity has been dealt only with the relationship between land and the individual person who uses it. Due to the existing disparity of income and means of production between the cultivators in the rural sector it is feared that the response of weaker section of farmer is not very much encouraging in relation to the intensification of agricultural activities particularly green revolution. Agriculture is generally organized on a family basis and its development is a complex process with many variables and wide range of substitutability. The capacity for development and social welfare has some definite meaning in relation to finite limit imposed by resources or by some total of inputs—including resources, capital formation, quality of population, optimum technology and optimum scale. But we mean capacity for development only with respect to the minimum amount of resource needed. It is true that the agricultural development constitute the highest economic use of different kind and grade of land and water resources ; but this involves consideration of more than entrepreneurial profits. Thus the real question of agricultural development and social welfare is the efficiency effectiveness of the farmer and the agricultural extension programme must give equal emphasis to both the technical and management approach.

TECHNOLOGICAL ADVANCE IN THE AGRICULTURE OF RAJASTHAN STATE

S. M. SOHAM

*Department of Agricultural Economics
Rajasthan College of Agriculture, Udaipur*

SUMMARY

An attempt has been made in this paper to prepare a technological index for different districts of Rajasthan to get an idea about their relative position with regard to technological advancement. The variables selected as an indicator of technological change were use of irrigation, high-yielding varieties of crops, chemical fertilizers, and chemical plant protection measures. The objective was to rank the districts on the basis of diffusion of improved agricultural technology. From the districtwise analysis the conclusion can be drawn that whole Rajasthan State can be divided into specific regions on the basis of agro-climatic conditions and level of agricultural development. Different agricultural development strategies are essentially required for the use of potential resources of the regions, and for the overall development of the State. The western region of Rajasthan (arid and semi-arid zone) which comprises one-third part of the State is most backward in agricultural development. This region seems to be untouched by various agricultural development activities. The eastern part of the State is comparatively more advanced in different aspects of agricultural development due to favourable geographical condition. Hence emphasis is needed for the development of the arid region to lessen the regional imbalances. Integrated area development programme is the most urgent need for this region with respect to communication, electrification, irrigation, introduction of improved animal husbandry, dairy and pasture practices besides crop production.

STRATEGY FOR AGRICULTURAL GROWTH AND EQUITY

S. M. PATIL

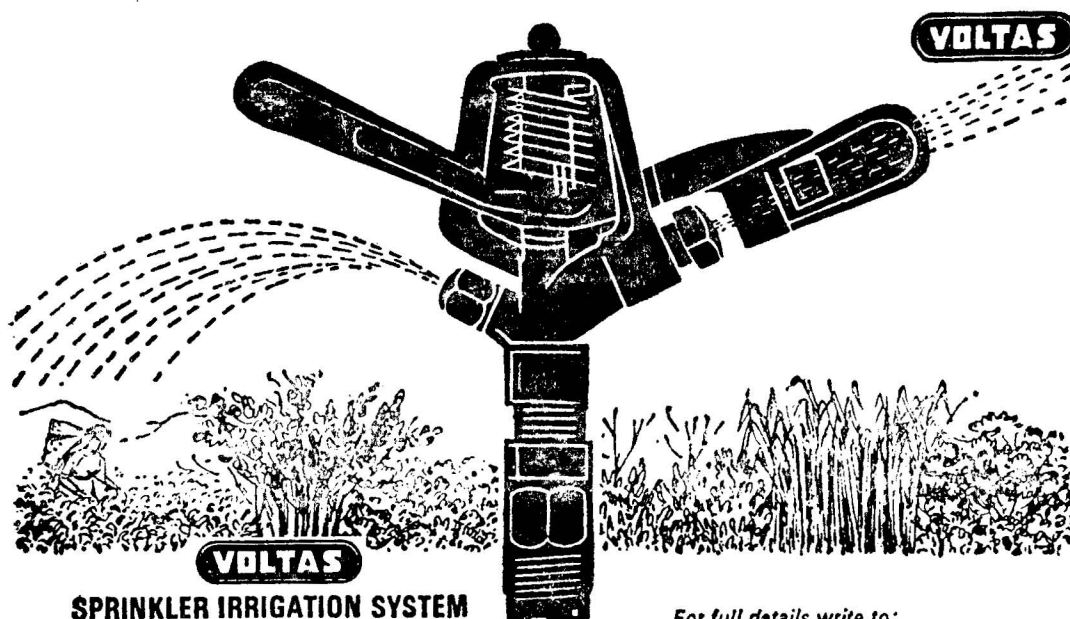
*Reader in Agricultural Economics
College of Agriculture, Poona-5*

SUMMARY

India is rich in natural resources—sunlight, temperature, sea water—tapped and untapped water resources, small farms, etc. Recent scientific researches exploited all these above resources and increased yields with genetic manipulation of high protein contents of wheat are obtained because dynamic agriculture has a vast scope. Due to wide awakening in rural areas, rapid agrarian advances leading to rural prosperity is possible, provided science is regarded as an integral component of agricultural programme. The strategy for scientific agricultural growth will cover the scientific breeding of milch and draft animals, improvement of pulses, oilseeds, fibres and other crops, adoption of agronomic practices, information transfer and limitations of exploitative agriculture, increasing yields of rain-fed crops, food needs such as milk, meat, poultry and other products, fish and fish products, etc., utilization of natural resources, saline and alkaline soils and other wastes, irrigational potentials, fertilizers for increasing production, devising ways and means or measures to fight the draught, judicious use of agricultural implements and machinery. With multiple cropping, utilization of non-conventional needs, application of science and technology, improved methods of crop production and crop protection, better processing of food stuff and scientific food storage, proteinous foods, nuclear agriculture—such as conservation of fruits and vegetables by irradiation, application of gamma radiation for preservation of sea food, research for animal science, planning for soils and water resources—crop research, etc., the need for co-operative research and personnel and organization, etc., will be required for future planning. This may again be reviewed in the context of (a) gross area covered for high-yielding varieties, multiple cropping, plant protection, (b) consumption of nitrogenous, phosphatic and potassic fertilizers, (c) gross area irrigated under major, medium and minor sources (d) institutional investment on minor irrigation, (e) agricultural pump-set energised, (f) private tube-wells installed, (g) indigenous production of tractors. As per Ricardo's model, the developing economy is determined by a high level of investment which increases production and helps to keep up wages. A rise in the wage level stimulates growth in population which increases the demand for food and necessitates the cultivation of progressively less fertile lands resulting in continuous rise in the price of food. In Ricardo's dynamic analysis, money wages go up due to the rise in agricultural prices which affect profits and growth of economy. As per Arthur Lewis' analysis, economic development with a saving of 4 or 5 per cent of its national income or less converts itself into an economy where voluntary saving is about 12 to 15 per cent of national income.

The marginal rate of saving plays a strategic role in the programme aimed at self-sustained growth. The production potentiality of an agricultural economy will be at higher level if capital-output-ratio is high. This requires wise planning and its proper implementation with an efficient administration. Planning, being continuous, process of development, must have a minimum technical base and the problems listed below coming in the way of agricultural growth must be overcome, *viz.*, lack of technically trained personnel to understand extension problems, lack of researches and researchers as to how best to make use of the scarce resources like seed, water, fertilizer, marketing, credit, etc., lack of farm managers regarding allocation of resources for maximum production with minimum cost, linking credit with marketing, lack of soil testing programmes and laboratories and the need of the other agricultural scientists, technologists, low receptivity of farmers for the adoption of efficient and optimum use of resources all these need proper agricultural policy strategy, including irrigational potential to be created and to be fully utilized. Besides other aspects for the development of social and cultural education, health and rural sanitation, co-operatives and village cottage industries, market and marketing, decentralisation of agro-industries, communication and transport, rural electrification, fishery and mining, trade and commerce and such other technical inputs required are to take place through the district planning board in every State. These boards must have a statistical cell for the evaluation of various developmental plans (especially in agriculture) which may take place during planning periods.

With the establishment of 19 agricultural universities and 72 agricultural colleges with a vast network of agricultural research stations, agricultural schools, taluka seed farms in our country, a strategy for agricultural growth and equity can be worked out and implemented for the provision of technical inputs through scientific staff and the students in collaboration with the State Departments of Agriculture, Co-operation, Animal Husbandry and allied ones in the wide and varied transfer of agricultural technology to the cultivators and accordingly each agricultural university and each agricultural college in a region or tract can undertake production programme in all seasons and execute it effectively.



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