Vol XLII
No. 3

ISSN 0019-5014

JULY-
SEPTEMBER
1987

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

Ind. Jn. of Agri. Econ.
Vol. 42, No. 3, July-Sept. 1987

SUMMARIES

ENVIRONMENTAL IMPACTS OF CHAMBAL IRRIGATION PROJECT, MADHYA PRADESH

J. S. Sisodia and S. C. Agarwal*

The objective of this paper is to make an assessment of the long-term deleterious effects of agricultural development on environment. Chambal irrigation project (Madhya Pradesh) has been selected for this purpose. The high siltation rate has endangered the Gandhi Sagar Dam and is reducing its effective life-span. The groundwater-table has risen from 70 feet to 20 feet from the ground level. The quality of water of drinking wells has become distasteful and unfit for irrigation purposes. About 30 per cent of the total canal system is suffering from severe seepage problem. Waterlogging has occurred over an area of about 39,791 hectares. About 65,704 hectares of land have been converted into saline soils. About 29,647 hectares of cultivated land and 37,998 hectares of Government waste lands have been submerged under Gandhi Sagar Dam. The aquatic weeds have flourished and spread all over the Chambal canal networks as well as cultivated areas. Malaria disease has been controlled to some extent but the incidence of dysentery has increased considerably. Areas under forests, permanent pastures and other grazing lands and land under miscellaneous tree crops and groves are shrinking gradually. The area under commercial crops is increasing rapidly causing an imbalance in the ecology of the region. *Deshi*/ local varieties of wheat and paddy are disappearing causing destruction of plant genetic resources. The fertility status of the command soils is dwindling.

STABILITY OF AGRO-ECOSYSTEM THROUGH IMPROVED TERRACING IN THE HILLS OF UTTAR PRADESH

K. M. B. Rahim†

An attempt has been made in this (*i*) paper to highlight the severe problem of soil erosion measured through the quantum of soil loss and the loss of plant nutrients from crop lands in the Uttar Pradesh hills, (*ii*) to study the impact of improved terracing on cropping pattern, level of crop technology and net farm income and (*iii*) to work out the benefit-cost ratio of constructing

* Senior Economist and Economist-cum-Planning Officer, respectively, Chambal Command Area Development Project, Gwalior (M.P.)

† Institute of Agriculture, Visva-Bharati, Sriniketan (West Bengal).

improved terraces. The tremendous loss of soil amounting to 48 to 718 tonnes per hectare per year under unterraced condition and 14 to 390 tonnes under traditional terrace condition can be reduced to only 9.5 tonnes per hectare with the adoption of improved terracing. Due to soil erosion, not only the nitrogen, phosphorus and potash but several other nutrients are also lost. Moreover, other physical characteristics of the soil also deteriorate. Improved terracing helps in withholding soil loss and loss of plant nutrients and also improves the physical characteristics and moisture holding capacity of the soil. All these create favourable conditions for higher productivity of soil and thereby higher net income to the farmers. It is evident that improved terracing helps in introducing superior crops replacing inferior ones. The use of crop technology is at its highest level in the case of improved terraces than in the case of traditionally terraced and unterraced plots. This is reflected in the achievement of highest net income per unit of land under improved terraces. It has been worked out that the conversion of terraces to improved ones is beneficial upto ten per cent slope under unterraced condition, upto 15 per cent slope under traditional (unirrigated) and upto 30 per cent under traditional (irrigated) conditions.

PLASTICULTURE FOR RESOURCE CONSERVATION

Sitesh Bhatia*

Injudicious use of natural resources by man for agricultural development has led to ecological imbalances and environmental disturbances which threaten to make the earth uninhabitable by the turn of the century. In this gloomy picture, plasticulture or the use of plastics in agriculture brings a gleam of hope. It can help conserve water, soil and forest resources and even reclaim something of what is lost more effectively than some of the conventional methods. It is suggested in the paper that plasticulture should be given more importance in Indian agriculture if an ecological disaster is to be averted.

IMPACT OF AGRICULTURAL TRANSFORMATION ON ECOLOGY AND ENVIRONMENT IN HARYANA

M. K. Chaudhary, H. S. Malik and S. N. Singh†

The new agricultural development strategy involving the use of high-yielding varieties (HYVs), irrigation, fertilisers and other modern inputs has over the last two decades made a far-reaching contribution to Haryana's economic development. But the external effects resulting from the application of new farm technology are inextricably linked with natural environ-

* Lecturer, Kalindi College (University of Delhi), Patel Nagar, Delhi.

† Research Scientist, Scientist (Agri. Econ.) and Assistant Scientist, respectively, Department of Agricultural Economics, Haryana Agricultural University, Hisar (Haryana).

ment. One such effect has been the rapid rise in the water-table (50 cms per year) in south-western parts of the State leading to the problem of water-logging and salinisation. The cropping system in the State is changing in favour of high value assured crops such as rice and wheat at the cost of legumes and coarse cereals. It spoils the crop ecology and recycling of organic wastes. The increasing use of HYV seeds and continuous cropping has caused serious pest outbreaks and emergence of problem weeds like Phalaris Minor for which regular use of weedicides is a must. The burning of HYV paddy straw in large tracts is causing air pollution which is harmful for human beings and animals. There is urgent need for suitable technology to make proper use of the paddy straw of HYV for making cubes for fuel purposes. The widespread and repeated use of pesticides results in a series of problems relating to pollution and health hazards, though the use of pesticides in Haryana is still within safe limits. However, the future strategy should be based on integrated pest management technique involving the use of chemical, cultural and biological methods.

ECOLOGICAL EFFECTS OF NEW AGRICULTURAL STRATEGY IN PUNJAB

J. S. Chawla and S. S. Gill*

The purpose of this paper is to bring into sharp focus the ecologically deleterious effects of new agricultural strategy in Punjab. The study is based on primary and secondary data, covering a period of eighteen years from 1966-67 to 1984-85. It was found that the new strategy affected adversely the indigenous varieties of cereal crops, crop system, soil system; the traditional sources of power and irrigation, medicinal shrubs and weeds and played havoc with the occupations of the people depending upon such enterprises. Wild life became greatly decimated by the intensification of land use through the new technology. Economic, social and political tensions emerged in the society due to modernisation of agriculture. Life became exposed to hazardous diseases like cancer, allergy, vomiting and giddiness. Social environment got deteriorated with the displacement of labour from agriculture. Therefore, policies need to be framed which protect the environment against the pollutant effects of new technology and are compatible with the settlement problems of weaker sections who can manage the water, forest and dryland resources of the economy in a natural way.

* Senior Lecturer and Head, respectively, Post-Graduate Department of Economics, Khalsa College, Amritsar.

CARRYING CAPACITY OF SELECTED WATERSHEDS IN SATLUJ CATCHMENT

Amar S. Guleria†

An attempt has been made in this paper to assess the carrying capacity of Gamrola and Kotgarh watersheds in the Satluj catchment of Himachal Pradesh. Gamrola watershed in low lying areas of Satluj catchment covers a little over 6,300 hectares with a population of nearly ten thousand persons, while Kotgarh watershed in the upper part/higher elevation covers 5,900 hectares of land with a population of over eight thousand persons. The purpose of framing the relevant model and its application in assessing the carrying capacity of the area with regard to human and cattle population would be more than served if it succeeds in creating the desired interest among the researchers and alert the policy makers who are deeply concerned with the environmental and ecological problems. Besides the ecological degradation, growing human and cattle population pressure results in decreasing the viability of farms, declining income, and increasing poverty and malnutrition. Hence, the concept of carrying capacity is more relevant in ecological and environmental studies and for ensuring sustained economic development. The limit of carrying capacity will vary not only from place to place but also within the same location at the static and dynamic conditions. Under the current level of technologies, the carrying capacity of Gamrola watershed has been estimated to be about 12 thousand persons. Increase in population beyond this level would lead to degeneration of the ecosystem of the area. Similarly, about 20 per cent of the cattle population is found to be surplus. But considering the changing level of improved technologies, it is found that about 996 hectares of land would suffice to support the existing population instead of 1,577 hectares under the current level of technologies in Gamrola area. In other words, the limit of carrying capacity under the improved technologies would be crossed by 1989 instead of in 1986 under the current technologies in Gamrola watershed. On the other hand, our study showed that the optimum carrying capacity of Kotgarh watershed with respect to human population is about 16 thousand persons. However in comparison to Gamrola area, Kotgarh watershed has relatively less elbow room in the form of cultivable waste land. Our exercise in this paper provides only a rough indication of what is expected to happen to some of the critical variables that are likely to generate pressure on the ecosystem of the two watersheds in the foreseeable future. Thus, it provides some basis for policies which need to be immediately formulated for the upper and the lower parts of the catchment of the Satluj river.

† Assistant Professor, Department of Economics, H. P. University, Shimla.

ECOLOGICAL AND ENVIRONMENTAL ASPECTS OF AGRICULTURAL DEVELOPMENT IN INDIA

V. K. Sharma*

India has witnessed a noticeable development in the field of agriculture during post-Independence period. It is well manifested in terms of increase in food production, number of workers engaged in agriculture and allied activities, the value of agricultural export, agro-based industrial production, and infrastructural facilities relating to transport, storage, market and inputs supply, etc. But this agricultural development has been associated with some severe adverse impacts on environmental and ecological conditions. The intensive efforts for enhancing food production to meet the requirements of the rapidly increasing population put a high pressure on land causing speedy deforestation, which, in turn, resulted in high soil erosion and severe silting problem. Secondly, large irrigation potential was created in the country to extend irrigation facilities, which was unavoidable in the adoption of improved production technology in the field of agriculture. But the creation of river valley projects resulted in significant rise in the water-table in the command area, leading to the problems of waterlogging and salinity. Thirdly, in the process of agricultural development, the use of chemicals like fertilisers and pesticides increased tremendously, which led to the pollution of surface and ground water threatening the lives of men and animals. All these facts make it imperative that the ecological and environmental aspects of agricultural development should no longer be ignored and must be made an important component of future agricultural policy. Immediate research efforts will also be needed to understand the cause-effect relationships involved in environmental hazards and to identify and quantify the relevant parameters to control and mitigate them.

POLITICAL ECONOMY OF REHABILITATION OF DAM EVICTEES

P. B. Parthasarathy†

In order to make an in-depth study of the problem of displacement and rehabilitation of displaced families, an enquiry was conducted in 15 out of 100 villages facing submersion under Srisailam Dam in Andhra Pradesh. A total of 1,06,925 acres of agricultural land and 20,728 houses are submerged by the execution of the dam. Over 21,000 families consisting of over one lakh persons living in 100 villages are displaced. The people, particularly, the poorer sections of the population displaced were subjected to great misery

* Associate Professor, Department of Agricultural Economics, G. B. Pant University of Agriculture and Technology, Pantnagar (Dist. Nainital).

† Professor of Agricultural Economics, Andhra Pradesh Agricultural University, Rajendranagar, Hyderabd-30 (A.P.).

and suffering. The problems associated with the submersion were many and varied. No attempt was made in the past (*i.e.*, before the construction of the dam was taken up) to study the life-styles of the people of the areas to be submerged (their occupation, employment pattern, economic status, social and ethnic characters, psychological feelings, attitudes towards development, etc.). Little attention was paid to the impact of the project on environment and people who would be displaced (both positive and negative). The government has failed to take the people into confidence and educate them about the areas to be submerged, the issues of compensation, displacement etc.

IMPACT OF IRRIGATION DEVELOPMENT PROGRAMME IN WESTERN MAHARASHTRA

D. B. Yadav, Jagannathrao R. Pawar and S. D. Suryawanshi*

The irrigation development programmes usually bring about changes in socio-economic aspects of the beneficiaries. The benefits derived by the beneficiaries are, however, at the cost of sacrifice made by a few families displaced from the catchment areas. To understand the impact of irrigation development programme in its right perspective, an attempt was made to study empirically the after-effects of Kukadi Irrigation Project on the various socio-economic aspects of the displaced and benefitted farm families, in particular, and on the eco-system balance of the region, in general. The study was based on micro level data obtained from a sample of 96 displaced and 96 benefitted farm families at two points of time (1979-80 and 1984-85) to facilitate before-after approach for evaluation of the impact. The study revealed that the socio-economic conditions of the displaced farm families became quite miserable owing to reduction in land and capital assets ownership, decrease in self-employment and disturbances in the old social attachments. The beneficiaries have, however, derived benefits in many ways. The overall project efficiency seems to be relatively low as indicated by the estimated benefit-cost ratio of 1.19 and economic rate of return on investment at 13.17 per cent. There is, however, a great scope to boost up the benefits of the project and maintain ecosystem balance through adoption of suitable policy measures relative to increase in irrigation water use efficiency, spread of new technology, implementation of crop substitution and afforestation programmes, control of pests, diseases and waterlogging problems, and equitable distribution of benefits among all the families in the project area.

* Senior Research Investigator, Professor and Associate Professor, respectively, Department of Agricultural Economics, Mahatma Phule Agricultural University, Rahuri (Maharashtra).