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Reviews in Brief

Socio-Economic Implications and Participatory Appraisal of Integrated Watershed Management Project at Bunga, Swarn Lata Arya and J.S. Samra, Central Soil and Water Conservation Research & Training Institute Research Centre, Chandigarh, 1995. Pp. ix+112.

The study attempts to analyse the socio-economic impact of an integrated watershed project of Ambala district of Haryana with particular reference to Bunga village. The specific objectives of the study were to examine (i) the impact of integrated soil conservation measures on both agriculture and non-arable activities, (ii) changes in consumption pattern of energy from various sources, (iii) functioning of Hill Resource Management Society, its income from various sources and investment pattern as well as people's participation in the management of common property resources, (iv) the impact of the programme on the role of farm women in agriculture and animal husbandry works and (v) the economic viability of various components of the programme, i.e., agriculture, animal husbandry and forestry. The watershed covers an area of 155 ha of non-arable and 336 ha of arable land and the data were obtained at two points of time, i.e., before (1983-84) and after (1991-92) the implementation of the watershed development programme. The analysis of data at farm level showed that there has been significant changes in area, yield and production in the project area after the watershed management programme.

The total number of farm families in the village increased from 121 to 151 between 1983-84 and 1991-92. The size of land holding decreased from 2.8 ha to 2.2 ha per family and the total cultivated area also decreased to 156 ha in 1991-92. There was an increase in the area under crops both in the *kharif* and *rabi* seasons. Maize, long duration arhar, groundnut, wheat and gram were the main crops grown in this region. Four new high value crops, namely, *toria*, berseem, cotton, sugarcane and lentil were introduced under irrigated conditions and bajra hybrids under rainfed conditions. The study shows that provision of irrigation and improved technology played a major role in enhancing the productivity of all crops. The production of foodgrains increased by 146 per cent, of cash crops by 410 per cent and of fodder by 267 per cent. The production of pulses and oilseeds also increased by 77 and 59 per cent respectively. With the increased availability of fodder and changes in the composition of livestock population, the milk production increased by 212 per cent from 231 thousand litres in 1983-84 to 723 thousand litres in 1991-92. The average size of standard animal units per family increased from 9.1 to 10.6 and the livestock density per sq. km increased from 225 in 1983 to 326 in 1991-92. Net income per capita from agriculture and animal husbandry increased at an annual rate of 8.6 per cent from Rs. 3,024 in 1983-84 to Rs. 6,366 in 1991-92. Afforestation programme further enhanced the resource use of the watershed area.

Before the project, people of the village depended heavily on the fuelwood for fulfilling their domestic energy requirements. After the project the average consumption of fuel per person increased from 3.23 kg/day to 4.11 kg/day which may be attributed to increased income from agriculture and husbandry. Dung production increased to 3,960 tonnes and the quantity of dung used for manure purpose increased by 188 per cent. The contribution of fuelwood in total energy consumption pattern declined from 68 to 40 per cent. This is

because a "Hill Resource Management Society" was set up in 1984 to ensure equal distribution of irrigation water and other natural resources among the villages. As a result the intensity of grazing in the forest reduced and villagers had to venture to far off places for collecting fuelwood. The project had a profound impact on improving the status of women. Due to afforestation and rehabilitation of hills, there was an increase in the time spent by women in agriculture and animal husbandry by 148 per cent and 195 per cent respectively. The percentage contribution of farm women increased in agricultural activities as compared with men. Multiple cropping system was adopted due to the facility of supplemental irrigation and as a result the production of all the crops increased which encouraged active involvement of rural women in agricultural activities. The overall literacy rate in the village improved and the literacy rate among females improved by 13 per cent as compared to 25 per cent among males. The average annual income of the whole village increased by 86 per cent in 1991-92 compared to 1983-84. The results indicated that the project proved to be economically viable and contributed significantly in enhancing the productivity and income of the farmers in the command area.

Notwithstanding the fact that the project has impressive achievements to its credit, problems like insufficient investment in animal husbandry activities, inadequate training provided to rural women to operate smokeless chullas, lack of proper maintenance of forestry and horticultural plants, lack of co-ordination among the departmental authorities and among the farmers in effective utilisation of soil and water conservation resources, need to be addressed to. The study suggested that efficient investment on watershed development would require efficient organisational and institutional arrangements and that technological package adopted should conform to the socio-economic requirement of the participants to achieve the full benefit of the project.

A Survey of Technology Transfer in Agriculture in Asia and the Pacific, Asian Productivity Organization, Tokyo, Japan, 1990. Pp. 301.

There has been rapid technological transformation in agriculture in the 1960s with the introduction of high-yielding variety (HYV) seeds and investment in irrigation, fertilisers and other inputs. In 1987, the Asian Productivity Organization conducted a survey in several of its member countries to make a general assessment of the impact of modern agricultural technology transfer in Asian agriculture. The specific objectives of the survey were (i) to examine the dissemination of agricultural technologies, particularly to the small farmers/landless workers and integration of traditional farming techniques and practices with modern technology; (ii) to identify the common problems and constraints in the dissemination of agricultural technologies and various measures employed by member countries to resolve them; (iii) to assess the impact of agricultural technology on the socio-economic conditions of rural communities in member countries and (iv) to recommend suitable policy measures catering to the requirements of the member countries in these areas. The survey has focussed on three major cereals, namely, rice, corn and wheat and was conducted by experts in these countries covering the period 1960-1987.

The study is divided into three sections. Section I presents a regional survey report based on the experiences on agricultural technology transfer in member countries. The section analyses the trends in area, production and yield of three major cereal crops and examines

the factors associated with the adoption of improved varieties of these crops. The results of the survey showed that there has been a significant increase in area, production and yield of the crops with the introduction of modern varieties in all the countries. The impact of technological change is influenced by the institutional and policy environment. Factors like availability and affordability of seeds, fertilisers and chemicals, availability of irrigation facilities and government policies have contributed to increased production. An important observation from this multicountry study is the wide differences in the research that has been done even for commodities that are strategic to the food security of a nation. This is true in both numbers and substance of research. Differences were also noted in the availability and reliability and accuracy of time-series statistics for various commodities.

Section II embodies the individual country reports on technology transfer in agriculture in eleven member countries of the Asian Productivity Organization, namely, Bangladesh, India, Nepal, Pakistan, Sri Lanka, Indonesia, the Philippines, Thailand, Fiji, Korea and Taiwan. Section III includes four appendices of which one presents the outline of the discussion topics.

This book would be useful to researchers who are interested in the study of technology transfer in agriculture.

Social Science Research and Thesis Writing, S.P. Dhondyal, 3A/7, Azadnagar, Kanpur-208 002 (U.P.), 1994. Pp. vi+282. Rs. 85.00.

Organised into three interlinked parts, this monograph deals at length with the characteristics of social science research, synopsis and thesis and the manuscript format and thesis writing. Part I deals with the concepts and definitions of social science research, role of theory and model in social research, development of scientific method in social sciences, research design and procedure, selection of the problem, its analysis and review, the nature and role of hypotheses in social science research, use of statistical methods in social science research, sources and methods of data collection, analysis and interpretation of data, testing the hypotheses, and evaluation of economic and social projects. The second part deals with the design of the synopsis for a research degree and the third part spells out the mechanism of thesis writing which involves the essentials of scientific style. This monograph will prove useful to social science research students.

The State of Food and Agriculture 1994, FAO Agriculture Series No. 27, Food and Agriculture Organization of the United Nations, Rome, Italy, 1994. Pp. xxii+357.

The volume reviews the food and agricultural situation in 1994, both at the world and regional levels, in the context of a number of major market and institutional developments affecting world agriculture, with a particular focus on the way policy makers 'conduct agriculture'. Part One on 'World Review' deals with the overall economic environment which was unfavourable to agriculture both in 1993 and 1994, and reviews the food and agricultural supply situation, agricultural trade, external assistance and food aid, trends in the international prices for major agricultural commodities, trends in the production and trade in the fisheries and forestry sectors. Besides it also reviews specific issues of emerging importance for agriculture like the impact of acquired immune deficiency syndrome on

national economies, the agricultural sector and food security; the effects of global warming on agriculture, forestry and fisheries; the signing of the Final Act concluding the Uruguay Round of multilateral trade negotiations at Marrakesh and the issues concerning the effective fisheries management in small island developing countries. At the global level, world food and agricultural production declined by 1.2 per cent in 1993 compared to the growth rate of 2.8 per cent achieved in 1992. In the developing countries, agricultural production increased by 1.7 per cent in 1993, which was lower than the 1992 growth rate of 2.7 per cent. Overall, the economic performance of developing countries has been encouraging compared to the industrial and transitional economies. The improvement in the economic outlook of developing countries can be attributed to a number of factors - the generally lower interest rates in the context of external debt servicing; the consolidation of economic reforms and stabilisation in many countries; the improved prospects for trade with the completion of the Uruguay Round; the North American Free Trade Agreement (NAFTA) and other factors like the recent strengthening in commodity prices; the massive inflow of private capital, reduced levels of strife in sub-Saharan Africa and the positive spillover of developments in South Africa.

The regional review attempted in Part Two, examines the recent economic and agricultural performances in the four developing country regions and the main policy developments affecting their agricultural sector during 1993 to mid-1994. It focuses more specifically on the experience of selected countries in each of the four developing regions: Ghana in Africa; China in Asia; Brazil in Latin America and the Caribbean; and Turkey in the Near East and North Africa. In Part Three a special chapter is devoted to Forest Development and Policy Dilemmas. It discusses the difficult policy dilemmas involved in managing our forest resources in a way that ensures equilibrium between economic and social demands, sustainability of production and consumption patterns and environmental stability. Forests have a crucial role to play in the stability of the biosphere, in maintaining environmental productivity, ecological services and bio-diversity and in sustaining economic development. In this context, a special chapter discusses the key issues facing policy makers and how economic policies affect forest resources and examines the future direction of forest policies, if they are to contribute to sustainable development.

Citrus in South Asia, S.P. Ghosh and R.B. Singh, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 1993. Pp. 70. Rs. 250.00.

This monograph embodies a macro regional study of citrus production in the six South Asian countries of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. It attempts to review the current status of citrus production, constraints, management, research and trade in these countries. Organised into seven chapters, the introductory chapter analyses the trends in area, production and productivity of citrus fruits in South Asia. Chapter 2 provides the historical background of the varieties and species of citrus fruits grown in these countries and the cultural practices adopted by them. The next chapter discusses the marketing pattern and trade situation prevailing in these countries and the future prospects for citrus fruits. The constraints faced by the farmers in the production of citrus fruits and the prospects for improved citrus production are discussed in Chapters 4 and 5 respectively. The last chapter briefly outlines a collaborative programme among countries of South Asia

with regard to exchange of information on citrus production and trade, and research and development.

Citrus is an important fruit crop which contributes about 15 per cent to the total fruit production in the Asia-Pacific Region. The analysis of overall growth in area, production and productivity of citrus indicated that the six South Asian countries contributed about one-third of total citrus production of Asia-Pacific Region out of which India and Pakistan together accounted for more than 95 per cent. The share of mandarins and sweet oranges was the highest accounting for about 81 per cent of the total production of citrus in these six countries. The world demand for citrus fruits is estimated to increase to 79 million tonnes by 2000 A.D. compared to 57 million tonnes in 1987. Though the growth in demand is estimated at 3.8 per cent per annum in developing countries, the prospects of imports in Far East (India and Pakistan) are not promising due to low purchasing power, lack of foreign exchange and import restrictions. The constraints identified in the production of citrus fruits include unsuitable site conditions and climate, undesirable and improper planting materials; malnutrition of trees; improper management practices and infestation of insect pest and diseases, including virus diseases and nematodes. To overcome these constraints, the study emphasises the need for using of desirable planting materials from certified bud wood sources on desirable rootstocks, application of plant nutrients based on soil and plant analysis, provision of supplementary irrigation at the right time with required quantity of water and adoption of plant protection measures against insect pests and diseases.