Chapter – 1

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Chapter – 1

INTRODUCTION, DATABASE & RESEARCH METHODOLOGY AND REVIEW OF LITERATURE

1.1   Introduction

Agriculture is the backbone of developing countries in general and the country like India in particular. Hence, the development of agriculture can play a very vital role in the rapid and overall economic development of India. Maharashtra is one of the developed states in India. Likewise, Kolhapur is one of the developed districts in Maharashtra.

Kolhapur district has in all 12 talukas (tehsils) consisting of both the developed and underdeveloped. Of which, after Karveer it is a Hatkanangale taluka stands developed taluka along with agriculture an important occupation. It stands second in the context of availability of agricultural land after Karveer.

Agriculture in Hatkanangale taluka of Kolhapur district is modern one, in which modern inputs, advanced technology is employed. Attempts have been made to provide irrigation facilities. In an attempt to increase agricultural output modern inputs and implements are used. The use of improved seeds, chemical fertilizers, insecticides, pesticides is also made. However, no attention is paid towards environmental issues and problems. This results in taking place of the environmental problems. The unscientific and over use of modern inputs along with unsuitable cropping pattern leads to land degradation and environmental problems.

1.2   Agricultural Development and Environmental Problems

Unscientific agricultural development neglecting environmental issues results in land degradation and thereby environmental problems, relating to agriculture. Land degradation includes not only erosion, but also loss of soil fertility due to loss of vegetation nutrient depletion, water logging and salination, structural decline and compaction. The problem of water and wind erosion is significant in India. Wind erosion is mainly restricted to desert part of the country. The most widespread hazard, water erosion is caused by excessive exposure of bare land due to partly managed logging operations, indiscriminate land clearance, over grazing and inadequate management of run off. In India, the average annual loss estimated to account for a loss of 30 to 50 million tones of agricultural production. Besides this, soil erosion has many side effects. Part of the eroded soil gets deposited in drainage, canals and reservoirs. It reduces their capacity and causes floods during the rainy season and droughts during the dry season. The problem of soil erosion is responsible for increase in frequency and severity of floods in India (Brandon and Ramankutty).

Water logging and salinity is mainly caused by badly designed and managed irrigation systems. Unlined canals and other water channels, use of excessive irrigation than crop requirement and poor quality of groundwater can lead to salinity or solidity of soil. The problem of water logging and salinity is very serious in India. By 1988, the productivity of about 20 million hectares of crop land (30% of irrigated crop land) had been seriously affected and the farmers had to abandon about 10 million hectares of productive land (APB 1991). Increased water logging and salinity severely reduces productivity of land. Average yield in case of properly irrigated system is more than 6 tonnes per hectares but in the case of saline areas it can be only about 1.5 to 2 tonnes per hectare (Bandon and Ramankutty).

The excessive use of chemical fertilizers and pesticides has many adverse effects. In some cases, it has resulted in eutrophiation in nearly surface water and accumulation of phosphates and heavy metals in soil. Fertilizers subsidies have further accentuated this problem particularly in case of big and medium farmers in India. Excessive use of pesticides has led to pest resistance and reduction of the pests predators, forcing a vicious circle of more frequent and stronger applications.

1.3   Statement of the Problem

Agriculture has a special importance in the life of human beings. With the growing population and demand for foodgrains and other purposes the efforts are being made to speed up agricultural development by employing modern tools, implements, inputs in agriculture excessively with taking care of environment. This has led to emerge out several environmental problems concerning agriculture, which have very severe impacts.

In 1996-97 all the farmers selected were suffering from land salinity. In all 67 farmers were randomly selected from four villages in Kolhapur, Sangli and Solapur districts of Western Maharashtra namely Shirol, Ichalkaranji (Kolhapur district), Bhilawadi (Sangli), Sangam (Solapur). It was seen that about 24.95% of the total cultivable land was out of use due to salinity. On an average each farmer was having 8.47 acres of land out of which he has lost about 2.11 acres (P. P. Koli). In Ichalkaranji (Hatkanangale taluka) the percentage of saline land to total cultivable land (135.95 acres) of sample farmers was 28.43% (39.08 acres). And in Shirol out of total cultivable land (65.25 acres) 28.04% (18.03 acres) was saline land.

It was seen that on an average each farmer has used 120.22 kgs of fertilizers, which was too much from the environment point of view. The all India data shows that about 50 kgs of chemical fertilizer

is used per acre. But this study shows it is two and half times excess than the national average (P. P. Koli)

1.4   Objectives of the Study

The important objectives of the present study are as follows :

1.   To study the growth of agriculture in Hatkanangale taluka of Kolhapur district since 2001.

2.   To examine the changes in cropping pattern of agriculture under study.

3.   To study nature and extent of environmental problems concerning agriculture of Hatkanangale taluka.

4.   To analyse causes of land degradation in the area under study.

5.   To assess the impact of environmental problems concerning agriculture on the output, productivity and farmers.

6.   To suggest measures on the environmental problems relating to agriculture.

1.5   Hypothesis of the Study

The hypothesis of the present study is as follows :

"Agricultural development plays a very vital role in economic development as well as in providing superior standard of living to the people. But in absence of due care of environment, agricultural development results in agricultural environmental problems, which can be a major hurdle in economic development as well as human well being."

1.6   Database and Research Methodology

The present research study covers the latest period from 2001-02 to 2007-08. The present study is depending upon both the primary and secondary data for its research. The secondary data was

collected from the sources such as publications of Ministry of Agriculture, Government of India, Economic Survey of Maharashtra, Socio-Economic Survey of Kolhapur District. The secondary data was collected from Barr. Balasaheb Khardekar Library, Shivaji University, Kolhapur, Agriculture College Library, Kolhapur, District Statistical Office, Office of Directorate of Economics and Statistics, Mumbai, Gokhale Institute of Economics and Politics, Pune.

Primary data was collected by administering a well-prepared questionnaire and conducting interviews in December-January, 2007-2008. For this stratified sampling as well as random sampling method was used. The representation to irrigated as well as non-irrigated farmers was given. Likewise, marginal, small, medium and large farmers were incorporated in the representation of the farmers. Due care of agricultural labours was taken. A random sample of 100 farmer households of the universe was taken.

The collected both the secondary and primary data was classified, tabulated in the light of hypothesis, objectives and chapter scheme of the present study. The data was processed by employing suitable statistical tools like simple growth rate (SGR), Range Ratio Analysis, Mean, Standard Deviation (SD), Correlation and Graphical presentation. Besides this, the use of computer software packages like EXCEL, SPSS was made for the processing of data.

1.7   Chapter Scheme

The chapter scheme of the present research study is as follows :

Chapter - 1   :   Introduction, Database & Research Methodology and Review of Literature

Chapter - 2   :   Growth and Cropping Pattern of Agriculture

Chapter - 3   :   Nature, Extent, Causes of Environmental Problems Concerning Agriculture

Chapter - 4 : Impact of Environmental Problems Relating to Agriculture on Production, Productivity and Farmers

Chapter - 5 : Conclusions and Suggestions

1.8 Title of the Study

The present research study has been completed under the following title.

"Agricultural Development and Environmental Problems : A Study of Hatkanangale Taluka in Kolhapur District."

1.9 Review of Literature

The subject of "Agricultural Development and Environmental Problems", which is a growing area of research. A few seminal contributions on the subject of study have been reviewed to identify whether the agricultural development is inversely related to the environment.

Hanumanth Rao (1994)[1] interrelated the five themes viz. agricultural growth, rural poverty, environmental degradation, participatory rural development, and economic reforms in relation to agriculture both growth and poverty interact with environment in complex ways each affecting the other and the another makes a critical appraisal of the participatory processes and also of some recent reforms which have implications both for poverty and environment.

Manikkumaran (1997)[2] in the state of Tamil Nadu has examined last 30 years secondary data from 1960-1990 and found that the agricultural growth is inversely related to rural poverty and directly related to bad environmental quality in the state of Tamil Nadu. ·

John E. Irked (1999)[3] found that the release and use of toxic substances, the exploitation of resources and physical alterations of the environment have had substantial unintended consequences

affecting human health and environment. Some of these concerns are high rates of learning deficiency, asthma, cancer, birth defects and species extinction, along with global climate change, stratospheric ozone depletion and worldwide contamination with toxic substances and nuclear materials. Also the study has suggested to the farmers that they should take due precautions to protect the environment and natural resources, as long as there is a reasonable change to do so, while maintaining profitability.

K. K. Datta and Bhu, Dayal (2000)[4] have discussed the indiscriminate use of poor quality water in the absence of proper soil water crop management practices poses grave risks to soil health and environment. The general objective of this paper is to outline an approach to estimate the direct economic damages from the use of poor quality irrigation water and to evolve techniques for the safe utilization of saline water in order to reduce the economic loses. This study is related to the AICRP Centre at Agra, has launched an Operation Research Project (ORP) on saline water use in Kanapur village of Mathura district, Uttar Pradesh since 1993. In this study they found that 96% of the tube wells have low quality water and only 4% found with good quality water. On high sodium absorption ratio (SAR) saline irrigated plots, the average yield of wheat decreased by 24% as compared to its average yield in good quality water, while under alkali and marginally saline water conditions the decline in its average yield is 19% and 15% respectively.

Bhagirath, Behera and V., Ratna Reddy (2002)[5] wrote about the "Environment and Accountability". This paper attempts to study the environmental impact of water pollution on rural communities in general and agricultural production, human health and livestock in particular. In this study, they have studied the environmental problems in the agricultural sector arose due to industrial pollution. This study is related to the state of Andhra Pradesh.

Mr. Nikam (2004)[6] studied the Kognoli village which is situated in the Belgaum district of Karnataka state. In this study he has considered the role of agriculture in economic development and its impact on nature, changing cropping pattern, use of fertilizers, pesticides, and irrigation water, which is a harmful for soil, quality of food and water and environment. The over application of chemical fertilizers is destroying the microorganisms of soil, which are useful for maintaining the fertility of the soil. He has suggested the sustainable and environment friendly farming.

D. S. Thakur and K. D. Sharma (2005)[7] studied the most progressive hilly state of India – Himachal Pradesh, tehsil Chopal of district Shimla and tribal tehsils Nichar and Sangla of tribal Kinnaur district. The study was carried out for the period of five years from 1998-99 to 2002-03.

In this comparative study of Inorganic Farming System (IFS) and Organic Farming System (OFS), they found that the IFS have made agriculture costly, risky, economically unviable and ecologically unsustainable. And on the other hand, OFS is useful for promoting the activities of soil micro organisms, improves soil structure, soil health and soil productivity to increase yields, production, income and profits of crops on sustainable basis. Organic Farming System produces more and sustainable agricultural output with less energy, low cost and fewer resources. Organic Food Production is the best for health as well as the environment; OFS is also helpful for the agro-ecosystem, biodiversity, compost, vermiculture, biological control of harmful insects and other pests.

Amita, Shah (2006)[8] has presented her research paper in the workshop on 'Trade Environment and Rural Poverty', Agriculture and Environment is one of the issues in this paper. She has done the comparative study of the India and Europe (EU) (with special reference to France). She found that the degradation of land was due to the higher level of irrigation, fertilizers, pesticides use. And depletion

of ground water is due to imbalanced use of chemical fertilizers. Environmental damage is due to inappropriate use of fertilizers, pesticides and irrigation. Input use in the agriculture has also contributed to the problem of global warming (Green House Gases).

The World Bank Economist Susmita, Dasgupta and a team of researchers (2006)[9] in the World Bank's Development Research Group have assembled and analyzed detailed survey data from Bangladesh and Vietnam on the risk perceptions of pesticide users, their pesticide handling behaviour and the effects of pesticides on their health and environment, under the heading 'Toxic Pollution from Agriculture – An Emerging Story'.

They found that one to five million farm workers are estimated to be suffered from pesticide poisoning every year (WTO, UNEP) and at least 20,000 deaths annually from exposure. Many of them in developing countries chemically polluted run offs from fields have contaminated surface and ground water, damaged fisheries and destroyed fresh water, ecosystems. It has also created growing 'dead cones' in parts of oceans close to river mouths that drain agricultural regions. Local agricultural pollution also has global effects.

Duong Van Ni, Vo-Tong Xuan, Edward Malt, Roger Stafford, To-Phue Tuong[10] they studied the Mekong Delta. They found that more than half of the 4 million hectares of the Mekong Delta was covered by Acid Sulfate soils (ASS). Digging canals and drainage to remove acidity are prerequisites for reclaiming Acid Sulfate Soils (ASS) for agriculture, but may create environmental problems such as soil acidification, acid water pollution and loss of functioning wet land ecosystems. In the future, strategies for sustainable development of the Mekong Delta should be based on balancing agricultural development and natural wet land ecosystem management.

Misra, S. G. and Dinesh, Mani (1994)[11] wrote about 'Agricultural Pollution in India'. The more use of fertilizers, pesticides, irrigation water create pollution through soil erosion and run off. The conclusion of this study is, for getting more yield farmers use more fertilizers, pesticides, irrigation water without testing the soil. But it is helpful to the problem of agricultural pollution. It is harmful to the farmers as well as the citizens of our country or any part of the world.

They suggested to the farmers, citizens about clear and detailed understanding regarding the problems arising out of agricultural pollutions. They felt that agricultural pollution can be controlled. They also wrote about the safe use of pesticides, legal regulatory control, alternatives to conventional pesticide etc.

The foregoing review of literature reveals that agricultural development and thereby environmental problems in a micro perspective is a missing aspect. Hence the present study takes due care of that. Likewise, this research study examines the nature, extent, causes and impact of environmental problems relating to agricultural development concerning one tehsil in Kolhapur district, is a micro unit as well as grass root level unit of administration. Thus, the present study has adopted a new approach towards the research on this topic. Therefore, this study is of very much importance.

1.10 References

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