

Agricultural Productivity and Ecological Imbalances in the Valley of Kashmir

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Agriculture has been a popular theme of geographic studies in India, it is not only because most of the people depend for food and several raw materials on it but also because the largest fraction of land under human occupation is used for agricultural purposes. Therefore, the geographers are primarily concerned with man's varied impact upon the earth's surface. It is still largely dependent on environmental conditions and represents wide spatial variations. To raise agricultural productivity has been the ultimate goal of agricultural planning. Agricultural productivity is the functional outcome of the physical base of the agriculture and socio-economic and cultural determinants. They include social factors, modern yield raising technology and inputs. They are supposed to present direct and positive relationship with the productivity. How far these factors which seem to be efficient to raise agricultural productivity. The chief objective of the present study concentrates mainly on a detailed study of variations of agricultural productivity in all the twenty tehsils of Kashmir Valley. Kashmir Valley being an agricultural region of the Jammu and Kashmir State, occupies an outstanding place in socio-economic fabric of the Kashmir civilization. Agriculture is the binding source of Kashmir economy. It is a leading element in the stability of the Kashmir society. More than 69 per cent of working population was dependent on this primary sector for the livelihood. This sector contributed more than 43.29 per cent of Gross Domestic Production (GDP) in 2002. Although agricultural developments from last few decades has not only increased agricultural production but improved the socio-economic conditions of the people living in rural areas. Agriculture is providing them the food as well as the many other products like, vegetables, dairy and poultry products of raising their income. It is a major source of providing raw materials to the agro-based industries. Hence any economic planning of the region towards its development should be agro-oriented in an integrated way. That would reduce the poverty, unemployment and will segregate malnutrition from the region.

The Kashmir Valley covers a total geographical area of 15.98 lakh hectares, out of the total area only 28.79 per cent is available for cultivation only. The total cropped area is 3.4 lakh hectares while, net area sown is only 21.26 per cent of the total geographical area of the region. These conditions show a pressure of population on cultivable land in the region. While this unprecedented population pressure may be further clear from the fact that average cultivable land availability per head of agricultural population is as low as 0.5 hectares only. Whereas nearly 97 per cent of farmers in the Valley of Kashmir lies in the category of small and marginal farmers with the average size of land holding at 0.7 hectares. This situation doesn't allow any meaningful investment and efficient

management of the agricultural sector in the region

Agriculture in the region is an old activity, it has experienced a slow change in early sixties. Thereafter, it has undergone vast changes, institutional, technological and infrastructure inputs have made considerable contribution in removing stagnation of agriculture in the region. So there was a substantial increase in production of food crops as well as in commercial crops. The pace of development had been rapid, it has been spread in all the directions, from more fertile plains of Valley Floor to the semiarid uplands (Karewas), from wetlands to mountainous areas of the Kashmir Valley. It's considerable progress overall periods has increased the net sown area and area sown more than once substantially. While the culturable wasteland and fallow land have increased respectively. The gains are reflected in the impressive increases in the yield rates of important food and non-food crops. The cropping pattern has changed considerably. The area sown more than once exhibited impressive gain in the Valley Floor. Areas under fruits and vegetables have recorded major gains in both area and production. There was a positive response in some of the important crops like paddy, maize and orchards from sixties in the region. This phenomenal development of Kashmir agriculture is attributed to scientific innovations that have taken place in terms of mechanical, chemical, genetic and civil engineering applications in agriculture.

In spite, the positive and encouraging agricultural achievements from last few decades. Kashmir Valley is continuously facing many challenges in agricultural sector. Although, these challenges are mostly found in all over India, but some of them are unique in nature. The biotic growth in the Valley of Kashmir is increasing at the rate of 2.92 per cent per year while, food production is increasing at the rate of 1.10 per cent only. This situation of the food production in the Kashmir Valley is not keeping pace with the population increase. In spite of the fact, food crop alone constitutes 65.63 per cent of the total cropping area, whereas more than 77.6 per cent of net sown area was under the paddy (rice) cultivation alone. The Valley of Kashmir is still facing the severe problems of food shortage. It is importing annually about 2.5 lakh tones of food grains to maintain the consumption standard of 522 grams per capita per day. This consumption of foodgrain is higher than the ICMR (Indian Council of Medical Research) norms of 420 gram per capita per day. So a concerted effort is needed to overcome this situation.

The agricultural development in the region has been accompanied with various agro-ecological problems. All ecological components of the region mostly land, water, forests, atmosphere and habitats have never been so threatened earlier as at present. Environmental degradation, loss of productive resources and soil erosion are quite serious. The lower forests in the Valley have shrunk due to encroachment. The erosions are particularly serious in the sloppy Karewas and pasture zones, it has been found that in some of these area as much as 75 per cent of the top soil has been eroded due to deforestation, overgrazing and indiscriminate cultivation of steep slopes. In addition to that, other disquieting features of new agro-technology i.e., high yielding varieties of

seeds, chemical fertilizers, irrigation and farm machinery have augmented the social issues simultaneously. The farm front has exhibited undesirable disparity in the size distribution of income. The areas having adequate irrigation and assured infrastructural facilities are performing much better in agricultural sector. While the areas combat with extreme climates, poor soils, and inadequate irrigation facilities could not achieve much, despite hard work of the peasants. As a result the gap in the income of farmers living in different agro-ecological zones has substantially increased. This has accentuated the inter-regional disparities in the levels of agricultural productivity, which are looming large just now. Obviously such progress would halt the social stability in farm community in long run.

There is no further visible scope for extension of the physical limit of the cultivable land in near future, because farmers in the low productivity regions are mostly uneducated, less innovative and less efficient. They are generally shy in the adoption of new technology and their poor economic condition is an impediment in purchase of new seeds, fertilizers, good tools and modern technology. Above all they are not mentally prepared to bring the change in the agricultural mosaic of the region. It is an established fact that educated youth feel ashamed of working in the agricultural sector. Under such conditions it becomes imperative to organize the agriculture in such a manner that the limited land is to yield maximum returning. This may be possible only by judicious use of land management and crop protection. Therefore, agriculture in the Valley of Kashmir requires heavy investment, which can be justified only by increasing the production ratio of crops.

The present study seeks to examine the various aspects of unsatisfactory agricultural scenario in the Valley of Kashmir. The existing socio-cultural and agro-ecological problems are so complex and complicated that a single research will not be enough to find out the actual truth. In order to understand the real problem, it is of great relevance to describe and interpret the land utilization and assess whether the land is being judiciously utilized. While the cropping patterns, crop concentration and crop combination also need serious and thoughtful probing with application of statistical techniques and methods. In order to minimize economic inequality and income disparities, it is appropriate to measure the agricultural productivity of the region at the tehsil level. For the overcome of these problems, whole the Valley of Kashmir can be delineated into agricultural productivity regions, so that a proper planning for crop combination could be made to reduce the regional differentiation in agricultural productivity in the region.

Methodology

The present study is based on primary and secondary sources of data. Tehsil has taken as a study unit. For the delineation of agricultural productivity regions, geographers have applied a number of statistical techniques. Such techniques vary from ranking co-efficient method to the monetary approach. Agricultural productivity regions carved on the subjective judgments, having no statistical basis are irrational and irrelevant. A

statistical basis is therefore, necessary to delimit the productivity regions. These methods minimize the changes of over simplified generalizations.

A number of statistical methods have used by the author to delimit the agricultural productivity regions in the Valley of Kashmir. The researcher has computed the intensity of arable land, intensity of net sown area, crop intensity index and intensity of irrigation by very simple statistical tools and techniques, Quartile method has been applied in measure rainfall variability at tehsil level. Pearson's correlation coefficient has been used to measure the population pressure on agricultural land in the region. The work has been adequately supplemented by primary data obtained from the selected villages by conducting field studies on the basis of information concerning i.e. yield per hectare area under different crops. The crop combination regions have been analyzed from the point of view of dominant and distinctive crop regions. To identify dominant crops, the prevalent statistical Standard deviation techniques have been used to work out by (Weaver's 1954, Doi's 1957, Rafiullah's 1965). A descriptive approach has been made at the initial stage by use of the ranking method. Comparative studies of these methods have been done and the one that confirms the suitable method regarded to the environmental set up of the Kashmir Valley. In order to assess the regional differences in the agriculture production, crop concentration indices have been calculated in all the regional units with the help of Jasbir Singh's (1976) Location Quotient Method. Another indices of crop diversification have been computed by the statistical analysis technique advocated by Jasbir Singh (1976).

For the determination of agricultural productivity, different methods have been adopted to measure agricultural productivity. In order to delineate the pattern of agricultural productivity of the Valley of Kashmir, the agricultural productivity was computed by applying, Kendall's technique of ranking co-efficient method the constituent areal units are ranked according to the per hectare yields of different crops and the ranking co-efficient, for each unit has been obtained. It is obvious that a component areal unit with relatively high yield will have low ranking co-efficient, if an areal unit was at the top of every list it could have a highest ranking co-efficient. Thus, having the highest productivity must be having highest ranking co-efficient and if it were at the bottom of every list, it would have a lowest ranking co-efficient, thus showing the lowest productivity among the constituent units advised. In order to get more reliable picture, an index by Husain (1976) has been prepared of all main crops has been accounted, their total production and their prices at the harvesting time. For this purpose area and production converted in terms of money of each commodity grown in each of the component areal units.

The methodology adopted for comprehending ecological imbalances, involves an investigation of the ecological perturbations at the scale of the ecosystem and the observation got by the field survey rather than the individual agriculture land use level by adopting this methodology one is able to lay a number of dimensions of agriculture change and their ecological imbalances in the same area.

For purpose of clarity and comparability the data are represented in varied forms of tables, maps, graphs and figures, supplemented by occasional photographs. The processed data have been plotted on the tehsil level maps of Kashmir Valley with the help of modern GIS (Geographical information system) technique. The tehsil level cadastral map of the Kashmir Valley have been scanned and also digitized manually using GIS soft ware viz, map / IFO 4.0. Finally, geographical interpretations of the results have been done with the help of the thematic maps, an analysis of change between (1990–93 and 1999–2002) has been shown by the choropleth maps. It is hoped that such maps themselves will produce more adequate explanations and will help to delimit agricultural productivity regions and the agriculturally weaker areas of the Valley of Kashmir.

Frame of the study

Based on an extensive review of literature and scintillating discussion with experts. This study attempts to revisit the agricultural productivity in the Valley of Kashmir and interprets the use of agricultural land as exists in the region. Further, tests position of crops in the different areal units and measures the agricultural productivity its impact on ecology of the Kashmir Valley. For purposes of analytical coherence this study is organized into seven chapters in a logical sequence, where in the arrangement follows the objectives of this research. Each chapter has been sub-divided such a way to give a full exposition of the agro-ecological mosaic in the region.

The first chapter of the study is in the form of introduction, which presents significance, and the statement of problem. The chapter extents in various dimensions i.e., objectives of the study, hypotheses to be tested, database of the study and methodology adopted in the study. Further more, Area of the study and Frame of the study have been explained. Above all a brief literature review of the pioneering works has been done in the measurement of agricultural productivity in India as well as in other parts of the world.

Chapter second is exclusively devoted to describe a detailed account of physical setting of the region and it discusses those aspects which have direct bearing on the agricultural land use like geology, relief, physiography, drainage, climate, soil, vegetation and land capability Classes.

Chapter third gives a detailed picture of general land utilization in the area of study during the trienniums (1990–93) and (1999–2002). Data have been analyzed, interpreted and decadal changes in the land use during the trienniums (1990–93 and 1999–2002) have been examined, apart from that, the size of holding, intensity of irrigation, pressure of population and optimization of agricultural land have been explained.

Chapter fourth examines the cropping pattern, ranking of crops, crop combination with comparative analyses, crop concentration and crop diversification in the region. Decadal variation in the cropping pattern during the trienniums (1990–1993 and 1999–2002) has been described in the chapter.

Chapter fifth assesses and measures the agricultural productivity of the region. It includes a brief discussion on the concept of agricultural productivity. Various measures of evaluating the agricultural productivity have been also included in the chapter. Further it seeks to delineation the area into different productivity regions. The chapter finds out the relationship between size of holdings, family labour, area under HYV, literacy, fertilizers, irrigation and per acre expenditure with the agricultural productivity. Further more, chapter analyzes the yearly production and its growth from last twelve years.

Chapter sixth highlights the impacts of agricultural productivity on land, climate, water, air, other fauna and flora in the Valley of Kashmir. The chapter deals largely with three major ecological problems confronting the Kashmir Valley, i.e., soil and land erosion, hydrological disturbance and climatic change along with some of the important chain reactions set in motion by them.

Chapter seventh i.e., last chapter of the study evaluates the strategies, policies and programmes in the form of conclusion, to overcome the deplorable conditions which use to happen on agriculture. Strategies and suggested opinions have been discussed to come-out from low productivity with deteriorated ecology to high agricultural productivity with a sustainable ecology in the Valley of Kashmir. It is hoped that this arrangement will care the task.