



APPROACHES AND CONCEPTS IN AGRICULTURE GEOGRAPHY

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ABSTRACT:

A legion of literature has been produced about the nature, methodology and approaches of agricultural geography. If one reviews the mounting literature on agricultural geography, two major approaches to the subject matter can be detected. The empirical approach attempts to describe what actually exists in the agricultural landscape. The normative or deductive approach is more concerned with what the agricultural landscape should be like, given a certain set of assumptions. The Commodity approach focuses on detailed spatial analysis of particular commodity such as the geography of Sugarcane, Wheat or Cotton cultivation. The main objective of the commodity approach is to make an in depth analysis of a particular phenomenon. The economic approach assumes that the farmer who takes decision about agricultural activity and the sowing crops in a given season/year is a rational or economic person. The main advantage of the regional approach lies in the fact that it provides an organized, systematic and reliable explanation of the agricultural phenomena spatially arranged over the earth surface. Ecological approach deals with the interrelationships of plants and animals (including man) with each other as well as with the elements of their nonliving environment.

OBJECTIVE:-

The main objective of the present research work is to have detailed study of various approaches in Agriculture Geography.

DATABASE AND METHODOLOGY:-

The data has been collected from various sources, which includes published and unpublished books, Government publications, journals etc. The methodology should be implemented description for this research paper.

INTRODUCTION:

A legion of literature has been produced about the nature, methodology and approaches of agricultural geography. If one reviews the mounting literature on agricultural geography, two major approaches to the subject matter can be detected. Empirical approach explanation of patterns is sought by inductive methods and generalizations are made on the basis of results from numerous studies. Normative approach leads to the derivation and testing of hypotheses and theoretically, to the development of an ideal model of agricultural location. These are the Commodity, Environmental,

Economic, Regional, Systematic, System Analysis Approach, Ecological, Behavioural, Humanistic and interdisciplinary approaches.

A) Empirical or Inductive Approach:- The empirical approach attempts to describe what actually exists in the agricultural landscape. It gives special privilege to empirical observations. According to empiricists, 'the facts speak for themselves.' In this approach explanation of patterns is sought by inductive methods and generalizations are made on the basis of results from numerous studies. For example, for the delineation of crop combinations of a given region, crop land use data is gathered from the farms and villages over period of time. This data is processed and plotted on maps and then an explanation of the combinations is made which ultimately lead to generalization and model building.

B) Normative or Deductive Approach:- The normative or deductive approach is more concerned with what the agricultural landscape should be like, given a certain set of assumptions. This approach leads to the derivation and testing of hypotheses and theoretically, to the development of an ideal model of agricultural location. The model of Von Thunen in which several assumptions, like isomorphic surface, economic farmer, isolated state, etc. have been made is based on deductive approach. These two approaches have never really merged, reflecting both the complexities of the decision making process in agriculture and the different times at which each has been popular within geography. It is essentially from the normative or deductive approach that models of agricultural location have emerged and once again model makers have operated along one of two lines, with the later developing out of dissatisfaction with the former.

While preparing an inventory of the works done in the field of agricultural geography one comes across many distinct approaches which adopt scientific methods of investigation. These are the Commodity, Environmental, Economic, Regional, Systematic, System Analysis Approach, Ecological, Behavioural, Humanistic and interdisciplinary approaches. In these the level of investigation is determined by the purpose of inquiry and availability of resources for conducting statistical field surveys. It can be grouped in to two scales, i) intensive study of small areas (micro scale) and ii) the extensive or general study of large areas (macro scale). As with normative and empirical approaches, there is a noticeable gap between these two groups of models and it would appear that even satisfier models are failing to explain the observed agricultural phenomena adequately. Despite these different approaches and the many methods available to the geographer, theoretical developments in agricultural geography have been slow. Indeed, it could be suggested that little real theoretical progress has been made since the pioneering work of Von Thunen (1826). However, different modes of explanation have been adopted by geographers to explain the agricultural processes and phenomena over the earth surface.

1) Commodity Approach:-

The commodity approach is based on the principle that any commodity when taken up for study should not be studied partially. Thus this approach focuses on detailed spatial analysis of particular commodity such as the geography of Sugarcane, Wheat or Cotton cultivation. The main objective of the commodity approach is to make an in depth analysis of a particular phenomenon. The approach may be explained with the help of an example. Suppose the geography of tea is to be discussed with commodity approach. In such study an attempt will be made to examine the environmental conditions such as temperature, moisture, soil, tillage etc. required for its cultivation. This concept deals with a single commodity and considers all aspects of its growth requirements, distribution, concentration, production, processing, marketing and consumption. It is often set in the various regions of the world which produce the total supply of the commodity under study.

The commodity approach was important in the Western European countries seeking to produce different types of food and raw materials from areas lying outside Europe. It was generally adopted by the British geographers, pioneers of this approach who produced comprehensive studies of agricultural products produced in tropical areas. In fact, they had a great need to identify food producing regions in the world and agro-based raw materials for use in developing their economic system at home in view of

the limited resources within their territory. Hence, they were interested only in the procurement of commodities that is transportation, processing and retailing of commodities from those parts of the world where there were surpluses. Studies of individual's commodities are still being carried out in large number in United States. In such studies the main emphasis is on production, particularly on determining the nature of conditions that make for a good produce of commodities in specific areas or stress on the conditions favourable for undertaking production of crops hither to not grown here. Though this approach provides useful information about the geoclimatic requirements of individual crops, it does not take into consideration the behavioural aspects of the farmers in their decision making process. Any study made with this approach gives only a parochial picture of geographical reality of an agricultural phenomenon.

2) Environmental or Deterministic approach-

The view that the environment controls the course of human action is known as deterministic or environmental approach. Simmons, maintenance that the environmental concept has been successfully employed as a method for the analysis and interpretation of land use system, particularly agricultural patterns. Further Harish is of the opinion that primitive agricultural systems correspond to the structure of the natural environment but the differences caused are due to the different methods used in rearing animals and raising crops. In studying the regional association of agricultural system and the underlying qualities of land or the environmental characteristics, geography made use of cartographic technique. The problem of measuring the degree of correspondence amongst different phenomena was solved by using statistical method. From a close observation of similarities disparities and imbalances in the environs the need arose for defining and delimiting the agricultural region. This is turn led to the realization that the environment is a primary factor influencing the economic activity of man.

It has been advocated by the environmental determinist that the characters of all vegetation, plants and animals including men are the products of temperature, moisture and prevailing weather and geoclimatic conditions. It has been proved by the ecologist and agricultural scientist that every plant has a specific zero below which it cannot survive. There is also an optimum temperature in which the plant is at the greatest vigour.

It has how ever been widely accepted that the complex phenomenon of agriculture is the outcome of interaction between ecological and socio economic conditions. Therefore, in order to conduct a geographical investigation in agriculture, it is essential to adopt any one of the following techniques.

1. Investigate the impact of different natural conditions on agriculture keeping the socio-economic determinants constant.
2. Study the influence of various socio-economic variables on agriculture, making the natural conditions constant.
3. Interpret agricultural activities as created by the combined influence of natural and socio-economic factor.

The environmental determinist thus argued that for any crop there are minimum requirements of moisture and temperature without which the crop will not grow. The cultivation of wheat in India maybe taken as an example to explain this point, the ideal physical conditions for wheat crop are found in Punjab, Haryana and western Uttar Pradesh. Going away from the 'wheat heartland' the intensity of its cultivation steadily declines in all the directions. In the north of Punjab, the winters are severe in Himachal Pradesh and Kashmir Valley in the south state of Rajasthan is arid with a high rate of evaporation, while east and southeastward the geoclimatic and pedological conditions are less conducive for its cultivation.

3) Economic Approach:-

The economic approach developed as a categorical rejection of the environmental deterministic approach. The economic approach as-sumes that the farmer who takes decision about agricultural activity and the sowing crops in a given season/year is a rational or economic person. He has the full

information about the elements of physical environment, the available technology and the demand of the commodities he produces. It is also assumed that the economic factors of market, production, transport and distribution costs operate on a group of homogeneous producers, who in turn react to them in a rational manner.

The protagonists of economic approach advocate that the relationships between physical environment and farmers are neither simple nor constant (Sayer, 1979). These relationships are governed by social and historical processes. The economic base or mode of production is seen as the key to understanding the complex web of inter-connections involving the institutions, patterns of behaviour, beliefs, etc. of the farmers.

The farmer's consciously discard one crop and adopt a new one to optimize their profits. The higher agricultural returns as a result of new cropping pattern change the material and technological base of the farmers. In brief, this approach stresses on economic determinism which has been quite popular in the writings of geographers of the developed and socialist countries.

In India, a tangible change has occurred in the cropping patterns during the last three decades. For example, the cultivation of rice has become quite important in the relatively less rainfall recording areas of Punjab, Haryana and Rajasthan (Ganganagar district) while wheat has been diffused from Punjab up to Dimapur (Nagaland) in the east, Maharashtra and Karnataka in the south and Suru, Dras and Shyok valleys of Ladakh in the north.

The cultivation of grapes in Sangli, Kolhapur and Satara districts of Maharashtra, pomegranates in the Talengana region of Andhra Pradesh, keenu orchards in Firozpur, Amritsar, Kapurthala and Gurdaspur districts of Punjab, the mint cultivation in Moradabad district of Uttar Pradesh, soya bean in the Malwa plateau of Madhya Pradesh and sunflower cultivation in the Sutlej-Ganga Plain have been diffused only during the last three decades. In fact, the cropping patterns and crop rotations in the greater parts of the Sutlej-Ganga Plain are no longer static. The traditional rotation of crops has been discarded and the fallowing of land for the recuperation of soil fertility has been given up. These changes in agricultural mosaics of India are the results of farmer's rationality and their desire to optimize their benefits by producing more per unit area.

4) Regional Approach:

The concept of 'region' developed in the eighteenth century is still a basic notion of geography. Classically, region is a differentiated segment of the earth surface or an area having homogeneity in physical and cultural characteristics. As this phrasing suggests, the study of regions was for a long time closely identified with a definition of geography as the study of areal differentiation. The concept of region is quite important in all the branches of the discipline including agricultural geography.

It was Baker (1926) who strongly supported regional approach for the study of agricultural geography. Subsequently, Valkenberg (1931), Whittlesey (1936), Weaver (1954), Coppock (1964) and Kostrowicki (1964) emphasized the importance of regional approach to the study of agricultural geography. In regional approach a country or an area is delineated into agricultural activity regions with the help of certain relevant agricultural indicators. Later on the agricultural attributes of the delineated regions are examined and explained. In regional approach, the micro regions constitute the micro regions which in turn become the components of macro region. This exercise continues till the entire earth surface is covered.

The main advantage of the regional approach lies in the fact that it provides an organized, systematic and reliable explanation of the agricultural phenomena spatially arranged over the earth surface. For example, the delineation of crop concentration, crop combination, and agricultural productivity regions helps in understanding the attributes of agriculture of the given region and explains the decision making process of the farmers. An in depth understanding of such regions also helps in generalization and the formulation of sound strategies for agricultural planning and development. This approach goes a long way in removing the regional inequalities in the levels of production of different crops.

5) Systematic Approach:

Systematic approach is also known as the 'general' or 'universal' approach. It was Varenus who divided the discipline of geography into general (systematic) and particular (regional) geography. The systematic approach is concerned with the formulation of general laws, theories and generic concepts. It is in contrast to regional geography in which models are designed with the help of certain assumptions.

In this approach an agricultural phenomenon (crop etc.) is examined and explained at the world level and then some generalizations are made. The spatial distribution of wheat or rice in the different continents and the explanation of its concentration in certain areas of the world is an example of systematic approach. The systematic and regional approaches to agricultural geography are however not opposed but complementary to each other.

6) System Analysis Approach:

The system analysis approach was adopted by Ludwig (1920) in biological sciences. According to James, a system may be defined as a unit (a person, agriculture, an industry, a business, a state, etc.) which functions as a whole because of the interdependence of its parts. A system consists of a set of entities with specifications of the relationship between them and their environment. Agricultural geography deals with the complex relationships of physical environment, cultural milieu, and the agricultural phenomena. System analysis approach provides a framework to examine and explain the agricultural activities at the field, village, local, regional, national and global levels. The complex entities and mosaic of agricultural activities can be understood with the help of this approach. It was because of this advantage that Berry and Chorley suggested system analysis as a vital tool for geographical understanding.

Each agricultural system has several elements (tenure, tillage, and irrigation, biochemical, infrastructural and marketing). These elements have their reciprocal effect on each other. The behaviour of a system, therefore, has to do with flows, stimuli, and responses, inputs and outputs and alike. The internal behaviour of a system and its transactions with environment can be examined. A study of the former amounts to a study of functional laws that connect behaviour in various parts of the system. Consider a system that has one or more of its elements related to some aspects of the environment. Suppose the environment goes under change (e.g., deforestation in Himalayas, canal irrigation in Jaisalmer, Bikaner, saline and alkaline formations in Punjab, reclamation of swampy land in Sunderban Delta, encroachment of agriculture on pastures, etc.), then at least one element in the system is affected and effects are transmitted throughout the system until all connected elements in the system are affected.

For example, if irrigation is being developed in an arid area, the people will shift from cattle rearing to cultivation of crops which in turn will affect the ecology, and the good agricultural production will provide more impetus to the farmers to use their arable resources more intensively. It will lead to a chain reaction in the system and both the ecology and society will be transformed. This constitutes a simple stimulus response or input-output system. This behaviour is described by the equations (deterministic or possibilistic) that connect the input with the output. A system, in which one or more of the functionally important variables are spatial, may be described as geographical system. Geographers are primarily interested in studying systems whose most important functional variables are spatial circumstances, such as location, distance, extent, area; sprawl, density per unit area, etc.

Though systems may be closed or open, in geography, they are generally open systems. In an open system, the elements of other systems also influence the decision making processes of the farmers. An in-depth study and systematic analysis of an open system thus becomes quite a difficult task. This point may be explained with the help of an example. The valley of Kashmir, nestled in Himalayas and surrounded on all sides by high mountains, apparently gives the impression of a closed system. Functionally, the reality is different. Through the Banihal Tunnel, the valley is well connected

with the rest of the country and the air and telecommunication linkages also provide enormous social interaction between the Kashmir valley and the rest of the world.

7) Ecological or Ecosystem Approach:

Ecological approach deals with the interrelationships of plants and animals (including man) with each other as well as with the elements of their nonliving environment. This approach focuses on the inter relationships of the biotic and abiotic environment and takes ecosystem as the home of man. The followers of ecological approach emphasize on the point that similar geoclimatic conditions lead to the similar agricultural activities. With the change in geoclimatic and pedological conditions, a change occurs in plants. Under the changed temperature and moisture regimes the plants (crops) have to struggle for their survival.

This process has been termed as 'natural selection'. Those plants which survived were better fitted to the environment than competitors. Relatively superior adaptation increase; relatively inferior ones are steadily eliminated. Thus, the main focus of ecologists is on the study of ecological conditions that promote or discourage the individual organism (crop) and communities of organisms (crops association) in relation to their habitat.

The domestication of plants, their diffusion pattern and disappearance from some of the genecentres may be explained with the help of ecological approach. For example, during the neolithic period, about 10000 BP (before present), Southwest Asia was the region in which wheat and barley were domesticated. But this region is no longer the main producer of these crops. The decline in wheat and barley cultivation in Southwest Asia may be explained ecologically. Over the period of last millennium the climate, especially the rainfall regime, has changed. Consequently, some of the plants could not adapt to this change and could not survive. Their place has been taken by other plants who could adjust in the semiarid and arid conditions of the region.

Transplantation of rice in Punjab and Haryana in the scorching heat of the first week of June when the daily maximum and minimum temperatures record 45° C and 35° C respectively and the relative humidity dwindles to only 11 per cent seems to be against all the ecological principles but the farmers are doing this with the help of canal and tube well irrigation. Man is not an innovator; he is an imitator and adopter also. These qualities of human being help him in taking some decisions about agricultural activities which may be against the ecological settings and environmental conditions.

8) Behavioural Approach:

In the study of agricultural geography the fundamental unit is the farm and the farmer. But most published agricultural statistics are available only at an administrative level that conceals farms by aggregation. Hence, it has been difficult to explain agricultural variations in terms of individual behavior. As a reaction to quantification, the behavioural approach has been adopted by some of the geographers to explain the agricultural activities and the decision making process of the farmers at the various levels. It became more popular after 1960 in geography. The essence of behavioural approach is that the way in which farmers behave is mediated by their understanding of the environment in which they live or with which they are confronted with. Behavioural geographers recognize that man shapes as well as responds to his environment and that man and environment are dynamically interrelated. The behaviouralists argued that environment has a dual character, i.e: (i) as an objective environment-the world of actuality; and (ii) as a behavioural environment-the world of the mind.

This illustration shows the difference between the 'objective environment' of the ice covered lake and the rider's 'behavioural environment' of a windswept plain. The traveller perceived the lake as a plain and took a decision to travel across the lake as if it were dryland. He would have acted otherwise had he but known. Apart from differentiating between the objective (real) environment and the perceived (mental map) optimize his profit. According to them, agricultural decisions, most of the times, are based on behaviour (values and attitudes) rather than on the economic benefits. In the tradition bound societies of the developing countries like that of India 'agriculture is a mode of life' and not 'agribusiness'. It is because of the socio-religious values that tobacco cultivation is not being done by the

Sikhs, piggery is forbidden among Muslims and dairying is a taboo among the Khasis of Meghalaya and Lushais of Mizoram.

It is also emphasized by the protagonists of behavioural ism that the same environment (resource) has different meanings to people of different socio-economic backgrounds and technology. For example, a tract of fertile land in the Sutlej-Ganga Plain has different meanings for the cultivators of different communities and farmers having different sizes of holdings. Living in the same village a Jat farmer prefers to sow rice and wheat, a Saini goes for vegetable cultivation and a Gujjar and Gada concentrate for the cultivation of cereals, sugarcane and fodder crops. The same tract of land has different meanings for a small cultivator with plough and a large scale holding farmer who operates with tractor and modern technology. The behavioural approach is a useful one as it helps in understanding the decision making process of the farmers who are largely guided by their social values in the decision making process. There are several weaknesses in this approach also.

The main weaknesses of behavioural approach are that it lacks in synthesis of empirical findings, poor communication, inadvertent duplication and conflicting terminology. Its terminology and concepts remain loosely defined and poorly integrated owing to the unsystematically organized theoretical base. Another weakness of the approach is that most of the data in behavioural geography is generated in laboratories by doing experiments on animals and the results thus obtained are applied directly to human behaviour. Koestler (1975) pointed to the danger of this strategy, in that behaviouralism has replaced the anthropomorphic fallacy—ascribing to animals human faculties and sentiments—with the opposite fallacy, denying man faculties not found in lower animals; it has substituted for the erstwhile anthropomorphic view of the rat, a ratomorphic view of man.

9) Inter-disciplinary Approach:

Agricultural geography, agricultural economics and agricultural sciences etc. are all concerned with the study of crop production and enhancement in crop productivity. In recent times agricultural geography intruded into related disciplines in the search of techniques, methods, principles and objectives to study man-environment interdependence, interactions and interrelationship. Subsequently, agricultural geographers began to tackle problems such as the interpretation of imbalances in levels of agricultural efficiency and disparities in socio-economic and agricultural development etc. which pertain to agricultural economics, agricultural sciences and sociology. At this juncture the sister disciplines were trying to be more exact in analysis so that an attempt at planning could be made. This fact made agricultural geographers also conscious of their inadequacy and they made an attempt at micro and macro level planning with knowledge gained from sister disciplines. Moreover, on account of a great intellectual ferment in the last three decades or so, inter or multi-disciplinary approach has developed into a viable movement.

The inter or multi-disciplinary knowledge which an agricultural geographers is able to utilise, helps him in coordinating and integrating the present day developmental plans and processes. With the introduction of the concept integrated regional planning and development, agricultural geographers began to play an active role in making plans for the development of backward and difficult areas. This contingency made it necessary for them to establish a stronger rapport with experts of related disciplines, such as agricultural economics, sociology and agricultural sciences. The closer association with these disciplines would give rise to area study programmes as directed by inter or multi-disciplinary approach. Besides, the application of quantitative methods measuring geographic relationship inter relationship, concentration, distribution, diversification and combinations borrowed from other disciplines have made agricultural geography more oriented to the problems of long range planning in underdeveloped areas.

CONCLUSION:

This has transformed agricultural geography from being an academic discipline into one of dynamic ones, capable of offering practical solutions. The increased interaction between social or agricultural sciences and geography has made it more society and planning oriented with greater

relevance to community developmental programs. Agricultural geographer's preoccupation and concern with the observance of spatial patterns has increased its value for other sciences, particularly the social and the agricultural.

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