

## **Agricultural Land Use Characteristics in Gaya District :**

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Land use as a comparatively new branch of economic geography is intimately associated with demand for a particular use of the land. Land use study involves principles and techniques. Further it includes controlling factors, classification, capability measurement, resource appraisal conservation, land reforms and planning of land use etc. All these have been explained with reference to Muzaffarpur district.

Gaya district centrally located in the southern genetic plain has been geographically suited for the agricultural practices and it has laid the cultivation of varieties of food grain, pulses, vegetables commercial crops etc. This has led the growth of the population high and the density of the population is also high. The whole study has been divided into nine chapters.

The first chapter incorporates about the theoretical aspect of population geography and land use. The study reveals that the two major branches of geography are very much important since they have been discussing the two major variants of man and land, the basic aspects of geography. Moreover the method, technique, purpose, needed research, review of literature etc. have thoroughly been dealt with.

The second chapter is exclusively about the study area Gaya district. The district is centrally located in the plain of Gaya region. The region is geographically suited for better agricultural produces where important crops cereals like rice, wheat, maize, pulse, vegetable fruits and other urban and commercial products are available. Since the land is the main resource of the district, naturally heavy dependency on agriculture and poor rural economy are the main characteristics of the district. The poor mass has been characterized by the less marketing capacity and hence the secondary and tertiary activities are less developed. The primary pursuit of the people has engrossed with low income traditional societies, social, imbalances, low percentage of literacy, lesser employment etc. This all has led the high ratio of pressure on land only.

The third chapter discusses in detail about the growth, distribution, density and pattern of population of the district. The population is growing with faster rate and the district stands first in total population in comparison to other districts of Bihar. Even yet the growing trend of population in the district is continuing even after the application of family and planning, other contraceptives or other artificial devices. But the distribution of population over the whole part of the district is not even. The southern part of the district is sparsely populated while the plain that is suitable for cultivation is comparatively dense. As the population is growing consequently the density of population is also growing with the passage of time hence increasing pressure of population on land is experienced on cultivated land. The projected population of the district touches fifty lakh up to the end of the present century and it will be double within a period of thirty years if the present growth rate continues in a future also. No doubt, the planning of the Government regarding family planning, adoption of contraceptives, medical facilities etc. have decreased the rate of both birth and death. The fourth chapter deals with the structure of population in the district. At first, the whole population has been categorized into three viz., working population, marginal and non-working population. Nearly one third of the total population is the working population on which the rest seventy percent population depend for food and shelter. The percentage of working class is low particularly due to low participation of females in the region. About four-fifth of the total working population is engaged in agricultural activities hence only one-fifth of the total working population in the district is engaged elsewhere other than agriculture. This is why, the standard of living of the people in the district is not satisfactory. It is mainly due to lack of their earning and education. The literacy percentage of the district does not touch even one-third of the total population due to a number of discrepancies. The Government devices of establishing a number of educational institutions to eradicate illiteracy from the region have been done to shorten the illiteracy. But old traditions of the society as well as their pitiable economic condition prohibit them from sending their children to the educational institutions. And it is being estimated that the recent improvement of educational institutions, changing attitude of the people, increasing income and literate immigrants are sure to increase the percentage of literacy in the district.

The fifth chapter of the thesis discusses the characteristics of general land use pattern of the district. It indicates that the net sown area has increased between 1981-82 and 2011-

12. But as due to lack of irrigational facilities in the region and poverty of farmers, existing net sown area is not properly used. In order to boost up the cultivating activities, eradicate poverty and facilitate the farmers, numerous schemes have been executed like upper Morhar, lower Morhar, lialjan scheme, Lokainweir Scheme, Gokula Weir Scheme, Gubsakari Weir Scheme, Niten weir Scheme, Nara River scheme, etc. Rivers are being dammed in order to utilize its water properly. The irrigation now seems essential to face vagaries of monsoon. However the northern part of the district having a net of irrigational facilities commands the highest intensity of agricultural while the central and southern tracts have the low intensity of agriculture. Single, double, multiple and mixed cropping is practiced in the agricultural system of the project area. Single cropping is absolutely dependent on rainfall while the double, triple, multiple or mixed cropping is aided by irrigation of varying intensity. The chapter six describes the agricultural land use of the region and indicates its major production of rice, wheat, maize, gram entils, arthar, marua, barely sugarcane, etc. Chillies, spices, sun hemp, jute and other fibre crops are other crops of the region.

The seventh chapter of the thesis present man and land symbiosis with the opening of the chapter, man-land symbiosis of Bihar has been described followed by the detailed description of man-land symbiosis of Gaya district. The symbiosis has been vitally influenced by the continuous growth of population. Per-capita share of land is decreasing day after day. The chapter presents a comparative symbiosis of Bihar state and Gaya district. It has also been described that what type of symbiosis would be an ideal and to what extent, the symbiosis of Gaya district varies from it.

## **MAIN PROBLEMS**

The research project on land use and population study of the Gaya district presents the following problems. The land holdings are continuously being sub-divided and fragmented. The small and smaller plots are less suitable for proper tilling watering as well as safeguarding for the farmers. A number of plot boundaries allow every corner of field which may go waste if not well managed.

The district receives periodical and varying amount of rain during different seasons. That is why for proper utilization of agricultural lands, timely irrigation is required in the district. Various means of irrigation systems have developed such a canel, tube well, ahar, pyne, etc. Canel

irrigation is limited to certain areas but farmers fail to get timely and adequate water at a time when irrigation is urgently needed. Apart from aghani cropping, irrigation is inadequate to utilize the harvested field for the second cropping in bhadai.

Rice is the single dominant crop in the district, hence it minimizes the chances of intensive uses of the same plot during different harvesting seasons. Besides food crops, growing of cash crops needs extra-economic strength of farmers but there is a little economic strength for the farmers of the district.

The productivity of soil is poor. With the increasing pressure of population on land the whole agricultural system needs to be modified.

This problem has remained and is continuing with more and more and further seeks.

Lack of adequate means of communication and transportation records the process of marketing of agro products. Bodh Gaya, Tikari, Baya are the main market centres of the district is under study.

Due to lack of animal husbandary schemes, pasture and grazing lands, the cattle have poor feeds and ill health. The cattle are tiny, weak and of poor breed. The district is very deficient in the use of commercial fertilizers mainly due to low purchasing capacity of cultivators and about the need innovation ignorance. Lack of cottage industries has raised dependence of population on agriculture. Agriculture oriented cottage industry should develop to absorb the surplus labourers and to decrease dependence on agriculture.

## **THOUGHTS OF PLANNING**

A comprehensive planning for the development of the Gaya district is grouped under the following heads :

Land planning is in essence the determination of the optimum use of every piece of land which must be elastic, and change from time to time to adopt the changing conditions. The Government has applied tenure to reduce the fragmentation of holdings and their subdivision. Intensive propaganda is being made to popularize the improved types of implements, methods and seeds to the cultivators. Subsidies, loans, and technical guidance are also being made to analyses

land resource on micro-regional basis so that land is also classified according to its capability. The sub-regions should be distinguished on the basis of their suitability for particular purposes. Some regions may be fit for cultivation of cereals, some for intensive farming and some for truck farming.

Proper cultivation requires early ripening and high seeds, knowledge of proper rotational crops suitable to the existing soils, better fertilizers, well developed irrigational system to meet the vagaries of the monsoon, use of agricultural implements like tractors, etc. by consolidating the fragmented small fields, etc. All these times involve money which is really difficult for the poor farmers to afford. Hence, they should be provided agricultural credit facilities towards which no doubt the Govt. has paid attention and taken a number of steps but its benefit is yet to reach all the needy cultivators. Efforts be made to ensure that the farmers, and tillers, are really being benefited to the extent they need it.

For the betterment of existing land use pattern, it should be planned so as :

- i) To grow more crops in quality and quantity.
- ii) To extend soil management programmes in all its needed aspects.
- iii) To expand the area of cultivation by using barren and cultivable land, sowing current fallow and other fallow and by maintaining balance in various uses of land.
- iv) To give more stability to effect desirable land use.
- v) To make all round development or integrated rural development through better use of land and by undertaking other economic and welfare measures.

Land use planning aims at a much better adjustment of agriculture to the extent physical environment for optimum exploitation of land and conservation of natural resources. The planning on land use may be classified as :

a) Plots are generally sub-divided and fragmented due to the law of inheritance so the size of the fields should be kept according to physical conditions omitting social causes. Consolidation of holdings should be enforced, and co-operative or collective farming should be practiced for better yield of crops. Management of soil includes proper drainage and locating proper soil for good crops. Soil testing laboratories should be set up at block headquarters also.

Farmers should be ready for crop management that is suitable for getting optimum crop yield and profitable return. Intensive cultivation will yield good result. In most of the area of the district aghani is dominant crop but the yield of bhadai, rabi and garma is lower mainly due to lack of irrigation. Hence double and triple cropping will prove fruitful to feed twice the population of the entire study area. It can be solved by constructing small size water reservoirs and tube wells. Some change in cropping pattern is also required. Scientific method of cultivation should be encouraged to bring other improvement in changing crop pattern. Moreover scientific technology, fertilizers, pesticides, improved seeds should be introduced in the area through block office and co-operative societies.

Irrigation controls agriculture. Inadequate supply of water for irrigation is the main cause of low intensity of cultivation, minimum area under bhadai, rabi and garma crops. The primary source of irrigation in the area is canal and tube well but they are neither satisfactory nor adequate. The first necessity is to provide ample power supply, then wells and tube wells will irrigate more and more fields to enhance land capability.

The proper market management require facilities from Government of semi-government agencies for supply of seeds, fertilizers pesticides and even food stuff etc. on reasonable price and the marketing produce on inscriptive price. The farmers should be encouraged to grow cash crops or commercial crops to supplement income.

Measures to improve the agro-products are given below:

- i. Reasonable stable prices of agricultural products.
- ii. Adequate marketing facilities.
- iii. Satisfactory system of land tenure.
- iv. Provision of credit on reasonable terms especially to poor tillers of the soil.
- v. Provision of education regarding agriculture and village.
- vi. Provision of education regarding agriculture and village.
- vii. The development of resources inputs by the Government.
- viii. Extension of land use through improved & scientific methods of cultivation.
- ix. Besides cultivation of crops, agro-based industries should be developed.

x. Proper infrastructure eg. Roads, electricity, transport etc. be promoted.

To improve the cropping pattern of the district, the suggestions given by the NCAER should be adopted in the district. These suggestions are :

The present way of haphazard allocation of land to different crops by the individual farmers is not in the best interests of the tillers. District planning officers should be appointed who would plan the crops for each season according to change in the seasonal and other factors like prices, yields, etc. The farmers should work in close co-operation with departments of agriculture, irrigation, etc. So that chalked programme may be implemented.

An agricultural mechanization should be set up where the size of holdings is too big, where the average farmer is unable to cope with hard labour. Effective and scientific agricultural tools will not only save the time of operators but bring about efficiency in farm activities commensurate with returns in the forms of increased yields. However, the large scale machinisation in agriculture on foreign lines is unsuited to the study area. Machinery can be profitably used only to the extent to which it saves labour that might otherwise be productively employed or to the extent it performs work.

These should be developed means of communication & transportation so that marketing facility ought to be available to the farmers.

The available statistics expresses that there are 1513 primary schools, 286 middle schools, 201 High schools, 26 Degree colleges about from a University. To raise the literacy percentage as well as its quality, it requires a lot of efforts. To improve public health conditions, the State Government has taken a number of progressive decisions which need be implemented. Population pressure on land is also very high in the districts so it should be checked by bringing down both birth and death rates to the extent that the population of the region be stabilized. It can be achieved with the help of family planning to some extent. But due emphasis will have to be put on the issue of raising the socio-economic condition, such as marriage – age, consciousness for having the small family, nutritional level, educational status, living standard, etc. particularly in a developing society like ours. Socially backward and economically poor inhabitants in some areas

lack good knowledge of family welfare devices. They need sufficient blankets or quilts to save themselves for the chilly cold of the longer winter nights (Dec.- Jan.)

So far as Gaya district is concerned, all the contraceptive measures like pills, capsules, tablets, etc. and the method of family planning like the use of condoms, loop, nirodh, sterilization, vasectomy, tubectomy, etc. are in vogue for birth control but their use and impact are only significant among literate people of middle and high income groups mostly in urban centres. Its response is very poor in rural areas, particularly among socially backward and economically depressed people, and through the Government organizes family planning camps in these areas regularly at least for a week in every winter.

Small scale and cottage industries such as grills, steel, furniture, rolling mills, rice mill, flour mills, crusher etc. be encouraged and set up at least at every possible place. Dairy and poultry booths should also be set up at sub-divisional headquarters.

## **SUGGESTIONS**

The investigator puts forward some suggestions for implementation during research work it has been realized from different angles. Its different aspects have been evaluated. The population of the district is almost touching saturation point in spite of the great potentialities of the region. The level of education and standard of living are very low. The district is backward from all points of view. So far as the planning proposals are concerned the peasants should leave their traditional land use practice in respect of changing man – land ratio and scientific development. The Government and agencies should provide irrigation to each and every field. They should practice co-operative farming for the integrated area development and better training facilities in big co-operative farms having good transport network and communication lines in rural areas for the movement of men and machines peasants under Crash programme and grow more food campaign. Thus under such a changing land use practice, it is quite essential to note down the traditional pattern of land use and remove the old system of cultivation for feeding the millions of growing people of the village and towns so as to raise economic status and to acquire self sufficiency. Only the planned survey and resource assessment can really help the peasant in land use planning for the posterity.



The research investigator puts forward relevant suggestions for the integrated area development of the district taking into account its resources, potentialities and liabilities. These suggestions are listed below :

1. Awakening of mass consciousness to subdue age old patterns of economic power.
2. Use of advanced technology and science to combat with every vestige of poverty.
3. Social & institutional changes to be made effective through a committed leadership assisted by a band of dedicated social workers.
4. Combination of adequate production of these good & services that matter to the rural masses.
5. Use of chemical fertilizers and manures in agricultural fields.
6. To combat with the plant diseases through insecticides and pesticides.
7. Land reforms to cope up with new farm technology and agricultural transformation.
8. To combat with the vagaries of the monsoon by providing irrigational facilities.
9. To deal with natural hazards for successful farming.
10. New technologies in agriculture need intensive care and management to promote higher activities.
11. Large member of new agro-based industries can be set up at rural growth centres by putting the locally available raw materials to the maximum use it will lead to the removal of unemployment in the district and creation of jobs.
12. Use of bio-gas plants and solar energy as infrastructure.
13. To improve living conditions and to lay road for application of agricultural inputs and for marketing the output viz Bazar Samiti and in Marketing yards.
14. As the study area is one of the largest producers of potato in the state, a factory to produce alcohol, biogases for paper chips etc. is most needed and would be set up near the holy city of Gaya.
15. There is a good scope of setting up a factory producing agro-products for gram, maize, gur and groundnut.
16. To eliminate criss-cross field bunds through consolidation of holdings.
17. To rationalize the use of the soil, sub-soil and surface water for increased productivity.
18. Integrated Rural Development programme will eliminate rural proverty that may crop up with population explosion.

19. To plan network of feeder roads and housing colonies based on modern techniques that emphasize optimum use of indigenous materials and human skill.

Village each of about five thousand population each should be picked up to plan a new pattern of habitat for providing real benefit of science and technology. It is necessary to make rural areas more development oriented. The research investigator suggests the development of village based on industries after utilizing agricultural, forestry, animal husbandry, poultry and other allied resources.

Each and every household should be treated as the hub of cottage industries, poultry, farms, bee-keeping, and such other economic activities which may add variety and quality to the gainful employment of the family members including children.

The farmers have to reduce habitation centres, increase farm production for higher economic returns to elevate home, earth and rural habituated. Poverty – line has to be erased from the rural and urban boundaries. Life style in rural areas of the region has to be changed for the best. Eighth plan must formulate technological policy and the action plan for meeting the challenges which are too many to note.

Rural employment programme and training of the rural youth for self employment with aid of science and technology are bound to build a suitable geographical region for the people to live in and enjoy life in a state of harmony. If all these schemes are carried out with zeal, intensity and sincerity, the region under study will remain a viable unit for habitation. The future children who will breath life at the threshold of the ensuring century (21<sup>st</sup>) will surely feel that they have been extricated from the plough of poverty, went and challenges of the twentieth. If winter passes, can spring be far behind ?

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