Dhar district lies in the south-western part of the Madhya Pradesh and it has got hilly undulating and plateau topography throughout its area. District has a triangular shape. The Vindhyachal ranges divide the region in two parts. Magaraba is a highest peak in the region. Its height is 751.0 meter above mean sea level. In south part of the district, the plains and valley of Narmada, are densely populated. District has an area of moderate climate and is favourable for crops and other agricultural activities.

According to the Census 2011, there are 21,84,672 persons live in the study area and distribution of population is very uneven. Most of it is concentrated in Dhar, Pithampur, Kukshi, Dhamnod, Rajgarh, Sardarpur, Badnawar, Dharampuri and Manawar town and cites. It is mainly because of their physical and economic setting. Average density of population is 268 person per square kilometer, which is high as compared to the state average of 236 persons. Hilly, rugged and dissected area have moderate to thin population in the district. Bombay-Agra highway is existed in south-eastern part of the district. Pithampur is one of the industrial hub of the Madhya Pradesh. It is known as the "Detroit of Asia".

Agriculture is such as economic activity that manifests the complex interrelationship between physical and cultural milieu, usually called geographical environment. Since the main thrust is to understand spatial aspects of agriculture, it is essential to present succinct geographical character of the district. Physical conditions of the region play pivotal role in shaping not only the physical landscape but the socio-economic landscape also. Particularly, such common man as farmer can hardly afford to ignore the physical limits. Physical environment puts problems to them and also provides solutions. But they perceive the physical environment in their own way, evaluate it according and try to extract best out of it. They process of extraction
and utilization of the physical environment, specialty for agriculture purposes, is influenced by the physical conditions on one hand and by the characteristics of the farmer, his society and economy on the other. But it is certain that new measures of agricultural improvement are considered and adopted in perspective of physical environment and the process of their adoption is influenced by the human factors.

Present agricultural land use reflects the impact of the nature of terrain and soils. Only 61.25 percent of the total area is net sown area, while only 47.30 percent of net sown area is double cropped area. Because of limited net sown area, pressure of rural population on net sown area (291 persons per sq. kilometre) is comparatively high. Because of this fact, net sown area increased by 3.08 percent, from 487.00 thousand hectares in 1975-76 to 502.00 thousand hectares in 2008-09. This would have been possible due to the reduction in area of cultural wastelands and other uncultivated lands. The main reason of this decreasing is the reclamation of such lands for cultivation. Similarly is the trend of fallow land in the district.

The present cropping structure is dominated not by foodgrains only but mostly by inferior millets. Nearly fifty percent of total cropped area is under foodgrains. But it is fact that fine cereals such as wheat, maize, jowar and rice occupy less than one-third of total cropped area. *Kharif* crop, maize, jowar and rice predominate in the district. Maize and jowar occupy about one-tenth of the total cropped area. In place of these inferior crops, other remunerative crops can be grown provided irrigation facilities are created. Above one-third of total cropped area is under oilseeds. It means, cash crops are also significant in Dhar district, which enhance the saving capacity of farmers. This situation may help in adoption of new agricultural innovations.
Dominance of superior crops in the Malwa plateau and the Narmada valley, results in high productivity due to the higher adoption of yield raising technologies. Contrary to it, the Vindhyan range and the Nimar areas are dominated by inferior millets. This situation reduces the adoption as well as productivity of land and people. It is pertinent to mention that area of cereal and pulses are shifted to commercial crops in the district. The area under non-food crops is limited, but shows positive trend. The cultivation of soyabean has shown very rapid change in the study area. Thus the crop structure of the district is being modernized and is leading to more profitable crops.

The productivity of crops is higher in sample farmers than the district average. Even productivity of food grain per hectare and per agriculture worker is higher in this district. It is the situation while this district is far behind in irrigation facilities and use of fertilizers. The relationship of crop productivity with operational and structural determinants presents direct correlation. Size of landholding does not follow persistent trend, however, marginal holdings have high productivity in most cases. But large farmers get higher yield on commercial crops in comparison to other size classes, while yield of cereals is highest on smaller size of holdings. It is of almost importance that the strategy of agricultural growth is specially focused on small and marginal farms so that productivity and returns from the small holding are improved for the goal of social justice.

The Scheduled communities, still have lower productivity than non-scheduled tribe of the society. These weaker section of the society could not avail appropriate technologies for raising yields or production. The required and sufficient productivity on their fields due to the traditional methods ignorance on their back. In fact, scheduled tribe and non-scheduled tribe farmers produce more from the same land due to high level of involvement in agricultural innovations as compared to the farmers of lagging communities, who less involved into the process of adoption of these innovations. Generally relationship of irrigation, cash expenditure and density of family labour and HYVs technology with productivity is positive.
The irrigated area is extremely low in this district. This low level has been scribed to the weak economic base of the people, therefore provisions for granting subsidies were made. Such incentives could not make exogenous method and techniques attractive to them. On the other hand some non Scheduled tribe people of the area utilized these facilities in the name of tribals. Even tribals have made it a fashion to obtain irrigation pumps on subsidy and sell them to non-Scheduled farmers on lower cost of market rate. Due to bribes and corruption in government programme Scheduled tribe people are benefitted very late and insufficient, as a result they can not get proper benefit from government programmes. The reason behind it is the simple characteristics of people low literacy and lake of awareness. Similarly the size of ownership of operational holding in agriculture determine the use of inputs and efficiency of farmers. Several yield raising technologies along with irrigation have been made available but they are not neutral to size and they are not within reach of every peasants. Being capital intensive the use of these technologies and inputs depends, with other thing on the capacity of farmers.

Among the measures adopted for increasing productivity, use of high yielding variety of seeds is of pivotal significance. The use of this along with other yield raising technologies has been influenced by the structural, social and economic characteristics of farmers and by the physical environment of the study area. With other things equal rainfall goes long way in conditioning the use of high yielding varieties of seeds particularly of rice. Besides this, nature of terrain and capability of land go long way in attracting and detacting the use of high yielding varieties of seeds. It is very well illustrated by the use of high yielding varieties of seeds of soyabean, maize, jowar, rice and wheat. According to the information of the land records, these miracle seeds can not over power the local variety of seeds. Only soyabean, cotton and jowar cropped area is under HYVs. It is followed by inferior millets maize, jowar, rice and bajra. For the soyabean and cotton entirely improved seeds are used. Inspite of this, productivity of wheat increased at slower rate than that of soyabean, maize and jowar. Very little rice cropped area is sown with high yielding varieties of seeds.
thereby reducing the share of superior crops in the district production.

High yielding varieties of seeds could be popular in ecologically favourable areas. There are only 04 blocks out of 13 having higher proportion of area under high yielding varieties of seeds than the district average. Further, structural components and socio-economic conditions of the society and perception behaviour of farmers have perceptible influence use of high yielding varieties. The information about innovations generally reaches through higher socio-economic or higher status communities from the outside through institutional or cosmopolite sources than diffuses within the community through inter-personal contract. In fact that, ladder adopted (i.e. schedule tribe) having low level of education, lower socio-economic status, less social participation are not able to use print media and mass media source of information. People of scheduled tribes are lagging adopters than the non-scheduled tribe people. Therefore, steps should be taken to remove such disparity.

Lagging adoption is ascribed to lower investment in farming. Investment and finance both are most significant economic determinants and life blood also for agricultural development in general and in the modernization of agricultural innovation in particular. But their demand and use are also influenced by size of holdings and social status of the farmers. It is remarkable that marginal and small farmers undertake a considerable amount of investment despite their deficit budget. But they could not avail the facilities of loan from different financing institutions. It is because the poor peasants with tiny parcles of relatively poor land are deprived of such qualifications. Contrary to it, large farmers have easy assess to financial and political power. Therefore, they do afford to take risk of obtaining and using yield raising inputs and such farmers are capable of producing surplus even without modern inputs. This is also true in the case of different communities. Scheduled tribes are for behind than the non-scheduled tribes. The socio-economic conditions of these farmers is poor and they are in grip of poverty. This is the situation when heavy subsidies are made available to these communities but
they could not avail them. Thus, there is urgency of creating consciousness about the declining fertility of soils among farmers. At the same time, inputs and techniques required for enhancing fertility should be made available easily to them.

During the field survey among the sample households interviewed to find out the status of tribal and non-tribal farmers between agricultural practices and the use of modern inputs. Under the cropped area of tribal farmers 709.40 thousand hectares (48.19 per cent) and non-tribal farmers 762.50 thousand hectares (51.81 per cent) have cultivated. Between the agricultural productivity 831 kg per hectares among the tribal and 1015 kg per hectares under the food grains productivity among non-tribal farmers. Nearly three-fourth (71.89 per cent) of the irrigated area among the tribal and more than 80.0 per cent irrigated area under cropped by non-tribal farmers. Besides 95.55 per cent and 98.08 per cent of tribal and non-tribal farmers under the use of HYVs. There are plant protection techniques, which under the chemical fertilizers only 85.31 per cent of tribal farmers and 88.44 per cent of non-tribal households. The proportion of tribal farmers is lower than the non-tribal farmers.

Thresher is the most popular implements for crop harvesting in present time and these implements have rested money and human-animal energy but tribal farmers have believed of agricultural implements using for modern technology practices. It is fact that also belonging of all tribal farmers are agricultural implements under the economic conditions determining the factors.

Under the food crops, 334 (52.18 per cent) and 306 (47.81 per cent) of tribal and non-tribal farmers grown under total cropped area. While, 306 (47.81 per cent) of tribal and non-tribal farmers grown under total cropped area. While, 306 (47.81 per cent) of tribal and 334 (52.18 per cent) non-tribal farmers grown under these crops.
Model of Tribal Development

Education

Less of Folk

Awareness

Economic help

Technical training

Adoption of modern Agricultural techniques

Development of Agriculture

Economic Development

Development of Tribal Community

Development of Tribal Area

Development of State

Development of Country

Development of World
The present study has attempted to gauge the process of development causing the modernization of tribal agriculture suggests that with the implementation of various agricultural development programmes deterioration in the quality of natural environment has been noticed. This has a negative effect the tribal people occupation and health. To monitor this problem some effective measures have to be adopted by local people at local level with support of the administration. To monitor and control these problems efforts at individual as well as at community level, are considered as the best options. Some of the suggestions based on field experiences are made to control the problem of land degradation and transformation of some in Portland measures has to be adopted by the villager as well as by the functionaries of the state government in the study region include.

To maintain the fertility of soil and presence fertilizers, use of composite manure to be encouraged alongwith the use of organic pesticides like Neem oil. This has to be adopted spacially Bekliya, Bordi and Minyapura sample villages considering the intensity of problem.

To protect the agricultural land from the water logging, use of the low lying areas be monitored regularly and proper drainage system be developed in the affected agricultural land of the villages in the study area.

To prevent land from the hazardous impacts of pesticides and chemical fertilizers, biodegradable products, adoption of organic agriculture have to be encouraged in rural areas. To cater these issues the technical guidance of the agricultural colleges and related training centres have to be ensured. Considering these issues regular survey of the areas training has to be provided to the farmers.

To prevent problem of water logging of the agricultural fields, drip irrigations or the use of Sprinklers have to be encouraged. Attempts have to be made provide subsidies on biodegradable products and in eco-friendly techniques.

Transforming the agricultural land to accommodate poultry and dairy, proper attention is required. Poultry and dairy farms should be far from residential areas and also form the rich agricultural fields.
Proper waste disposal facilities and drainage facilities be provided by the state authorities and government.

To prevent from soil erosion basically from activities, attention and farm processing training should be provided by the authorities. Proper education of farmers can control the level of modernization and adoption of agriculture. Education gives knowledge to understand and to evaluate the present situation, keeping future in mind. So proper education should be provided to the tribal and non-tribal farmers.

The use of modern agricultural implements and their proper monitoring has to be ensured for agricultural development. To develop the transparency in implementation of various agricultural development programme as well as prevent corruption of functionaries and interference of political leader. Provide primary and secondary education to remote villages with better educational facilities.

Effectively implement various agricultural development programme for control the out migration of marginal workers and agricultural labourers. Construct a check dam barrages on Bekliya and Bordi sample villages on nallah and river for increase the irrigation. Establish Van Gram Samiti in every villages as like the Bordi village. Provide funds to these, NGO for plantation and prevent base forest cutting.

Agricultural implements have to be properly monitored and develop according to present need and gave the subsidy on modern agricultural implements and HYVs seeds. Motivate the tribal farmers for adoption the new innovations. To provide for patta lease of agricultural land for tribal farmers and below poverty line farmers of non-tribal farmers. This agricultural land to be must fertile and level.

The developmental programmes planned for the particular community will be implemented properly so that the needy persons will be benefited. People will be make aware about land reformation and avail facilities in this regard. Ceiling surplus land should be provided to Scheduled tribe farmers. Tenancy reforms and alleviation of tribal landholders. Minimum wages will be provided to tribal and non-tribal agricultural labourers. To monitor and strictly prohibit
private financial personnel or institutes providing loan to farmers on higher interest rate.

The present study revealed that the level of technological adoption is low in majority of the tribal farmers. At the same time, the proportion of high adopters of technology among non-tribal farmers is very high. This difference in the level of technology adoption by the tribal and non-tribal farmers of the same area may be due to socio-economic and cultural factors as well as their knowledge about the new agricultural practices and attitude towards these practices. It may also be due to the gap between the tribal farmers and extension staff of the state and local self-governments. Though several programmes have been implemented in this tribal area by the State Government, the level of technology adoption by tribals has not improved substantially. It is, therefore, essential to educate the trials about the new practices of crop cultivation and the possible benefits of the new practices. This would definitely change positively the attitude of tribal farmers towards the new agricultural technology. Further, the State Government and Zilla Panchayat should pay attention towards the spread of knowledge about new agriculture practices and the supply of the crucial inputs like HYVs seeds, fertilizers, pesticides, etc. This study has shown that soyabean, maize, wheat and kharif jowar are the main crops of district as well as selected villages. The tribal farmers use both HYVs and local varieties of these crops whereas non-tribal farmers use only high yielding varieties. So this shows the need of making the tribal farmers to use HYVs of seeds. Furthermore, the supply of these inputs should be on time, in adequate quantity and at subsidized prices. Government should also give emphasis on creation of irrigation facilities in district as the present net irrigated area is very low. As far as irrigation is concerned, special attention needs to be given towards the tribal farmers.

The results of the study has indicated that the factors like age of farmer, literacy, size of holding and credit orientation influence the technology adoption by tribal farmers positively. This allows us to suggest that there is need of increasing the literacy among the tribal households of district. Efforts are also essential to increase the size of
their operational holding to make their farm units viable for the adoption of new agricultural practices. They must be educated about the sources of institutional credit like cooperative credit societies and banks.

The study has indicated that the size of holding and income from crops were the two important factors which affected the level of technology adoption by non-tribal farmers. On the basis of this it can be suggested that there is need of further increase in the crop income of these farmers. Market support policies are required to be initiated for the farmers of the study area.

It is found that soyabean and Kharif maize were the two main crops of the selected villages as they together occupied two-thirds of total gross cropped area of the villages. It means Kharif maize and soyabean are the main crops grown by the farmers of selected villages. Productivity of these two crops was higher on tribal farms as compared to that on non-tribal farms. This may be due to low adoption of new agricultural technology by tribal farmers of the study area. The study indicated that in case of non-tribal farms, the productivity of major crops tended to increase with the increase in the level of technology adoption. It is therefore, to take necessary steps to induce the tribal farmer to go for adoption of technology which will ultimately increase the productivity in these farms.

The present study has indicated that there is positive association between the annual employment of tribal male workers and non-tribal female workers on the one hand and the level of technology adoption on the other. This allows us to suggest that the efforts are essential to increase technology adoption in order to increase employment on farms in the study area. This may also help in increasing the level of income of tribal farmers which at present is lower as compared to income level of tribal farmers due to high adoption of technology would also lead them to spend as much on consumption expenditure as their counterpart non-tribals spend.

Infrastructural facilities like roads, marketing, irrigation, communication are very meagre in the study area. There is scope for
increasing the irrigation potential through minor irrigation projects. Though there is monopoly procurement scheme for purchase of farm products of tribal farmers, most of the tribal farmers use to sell their produce to money lenders for the repayment of debts. So there is need of strengthening the monopoly purchase scheme for the tribals. Efforts are also required to increase the transport and communication facilities in interior tribal villages of the study area. The gap between extension staff of the government and tribal farmers needs to be reduced by undertaking appropriate measures.

To monitor the identified problems systematic and effective measures have to be adopted by administration with the collaboration of local people. To check, control and monitor these problems efforts at individual level as well as at community level, society, region or state considered to be the ideal.

Considering the nature of the present study available literature from books, journals, doctoral research works, reports of various government department and agencies working on environment and related issues, and the report of various magazines and periodicals covering the field of study, specially, development programmes related to agriculture, occasional issues published by various agencies, articles based on field studies reported in state and national daily newspapers, reports of central and/or state and those of development activities were consulted and the required related data and material was collected. In depth reading of the literature and discussion with various researchers positively helped in improving the research plan by making needful modifications. For this purpose Jawaharlal Nehru Library, Dr. H.S. Gour University Sagar; Library of Devi Ahilla University, Indore and the libraries of various government departments and that of national and state research institutes too were consulted.

To fulfill the requirements as per the objectives of the study both primary and secondary data have been used in the present research work with repeated efforts. Primary and secondary data
related to various status of agricultural development and related to its role in modernisation of the region have been collected.

To collect the primary data considering the objectives of the study, a set of detailed questionnaire was designed and developed, for the village and rural household survey.

Considering the nature and requirement of the present study. The collected data was processed and classified by using various frequency distribution and different statistical methods. The classified data was arranged in short and systematic tables, based on purpose, origin and construction, the processed data was presented in the tabular form.

Looking to the need of the study the processed data have been diagrammatically and cartographically presented to identify the patterns and to understand the possible reasons for emerging relationship among the variables. Various diagrams and choropleth maps along with consideration of these too have been used for meaningful presentation of the processed data and emerging patterns were identified.

The processed information and data cartographically presented, has been interpreted and analysed to understand the role as well the impact of modernisation, has caused the adoption of agriculture. Researcher has successfully attempted to understand and finally to explain rationally the process of adoption in the study region.

The study presents the spatio-temporal pattern and the impacts of new innovation, policy and programme, diversification and commercialization of agricultural activities. The research explains gauging the impacts of various socio-economic activities which have caused and are causing agricultural modernisation of the rural tribal areas.

It became possible to identify the areas where the traditional agriculture has already been effected due to the multidimensional activities. It positively helped to understand the reasons, causing degeneration of environment in the identified tribal areas. The study
helped in analyzing the nature and composition of the tribal farmers and the process through which their activities have been modernised in the study region.

The findings of the study make the meaningful suggestions for the remedial measures to ensure the improvement in the agricultural activities and also to monitor and control the processes of agricultural modernisation. The outcome of the study proposes alternate methods to ensure the balanced agricultural development and also to check and monitor the process of agricultural modification in the tribal areas of the region.

Finally, considering the findings of the study attempt is made to identify measures to control and monitor and to minimise the ever increasing problems being noticed with the status of tribal agriculture.

Content of the present study is divided into eight chapters. The first chapter deals with the physical basis of agriculture, chapter second explains the cultural background. The agricultural land uses has been discussed in the third chapter. Cropping patterns has been examined in the fourth chapter. The crop production and productivity has been explained in the fifth chapter. The sixth chapter discusses the views and use of irrigation in the study area. The seventh chapter discusses the adoption of agricultural innovation and finally in the eight chapter conclusion have been presented alongwith the identified problems of tribal agriculture and solutions.

Mekusingh Nigwal  
Candidate

Dr. C. K. Jain  
Supervisor

Prof. R.P. Mishra  
Head
Department of General and Applied Geography  
Dr. H.S. Gour University, Sagar (M.P.)