

# **Chapter Eight**

## **Summary and Conclusions**





## Chapter Eight

### Concluding Remarks

#### **8.1 Introduction:**

The tribes account for a substantial proportion of the India's population. They are mostly clustered and concentrated in the agriculturally unsuitable hilly, forested and the topographically inaccessible areas of the country. Prior to the planned interventions into these areas during the colonial period, these communities sustained themselves maintaining symbiotic relationship with the natural resources of their ecologically fragile milieu. Penetrations during and after Independence introduced unprecedented transformations into the tribal areas. Not only the tribes lost their traditional rights on the economic resource base, particularly the forests, but also of their social and economic modes got destabilized. Bereft of free access to the bounties of the milieu and any alternative economic avenue for sustenance, the tribes were now left with the options of cultivation of crops in the otherwise agriculturally unsuitable land, and unskilled wage labour work both within and outside their habitat. Majority of the tribes, particularly of the central Indian tribal belt encompassing the southern parts of Rajasthan, eastern Gujarat, Madhya Pradesh, Chhattisgarh, western Odisha, Jharkhand and western West Bengal, depend on these two professions to eke out bread. The age-old traditional wisdom of managing and making multiple use of the local resources is almost lost in the present generation of the tribes. They have adopted the peasant mode without proper understanding it's finer nuances and are applying it despite physical constraints and weak human resources.

The contention is not to thwart the development process and keep the tribes away from the vortex of development, but to facilitate them to utilize the resources of their milieu integrating both traditional and modern wisdom. Since the beginning of Independent Indian planned development endeavours, several programmes and schemes targeting various faculties of their livelihood have been envisaged and implemented for the welfare of the tribes and development of tribal areas. Despite promising prospects, the success of many of these efforts have yielded poor results perhaps due to the typical physical characteristics of tribal habitats and poor human resource development among the tribal populations.

An attempt has been made in the present research to comprehend the situation in the tribal areas. For the purpose, in-depth study of the processes of development in the Chhota Udepur district (earlier a part of Vadodara district), which is a micro region of the tribal belt of Gujarat, has been done. Stress has been laid on the economic pursuits of the target population. The study examines and analyses the major constraints of the tribal agriculture and allied activities at macro and micro levels with generalizations and, contemplates a few solutions which could help the planners and administrators, and open the vistas for further research. Overall understanding of the outcomes has briefly been presented in this chapter.

## **8.2 Observations, Findings and Conclusions:**

The scheme of regionalization of Gujarat by the 1991 Census into two meso-regions has been adopted in the present research. The tribal belt of Gujarat corresponds broadly with its eastern hilly region, of which Chhota Udepur district is a part. Chhota Udepur district encompasses within its boundary parts of three different natural regions namely, Vindhyan Hill Ranges, Orsang-Heran Plains and Narmada Gorge. Each region has its individual characteristics and issues. While the Vindhyan Hill Ranges and Narmada Gorge regions display some similar physical characteristics, the Orsang-Heran Plains is distinct with its plain topographical conditions. At the secondary level, the twelve Integrated Tribal Development Project (ITDP) districts and at primary level, the six tribal *talukas* of Vadodara/Chhota Udepur district have been considered for the research.

Climate is one of the most important factors which influences all the governing aspects of natural resources and in turn, cropping patterns and agricultural practices. Rainfall is unreliable and for only a short period of time across the country, including Gujarat. Groundwater and surface run-off meet the major demand of irrigation. Poor management of irrigated water and productivity-based availability of water are the main challenges in the eastern region of the State. In the Chhota Udepur district, there are immense fluctuations of rainfall which is the prime causal factor for problems of sustainable agriculture. Climate is more difficult in the State as it lies in a critical position on the flanks of the Arabian Sea branch of the monsoon. To increase crop production, tribal farmers extract groundwater to compensate for the irregularities of rainfall, which in turn destroys the sustainability of the environment with deteriorating ground water levels.

ST communities feel safe and satisfied by living in the outskirts of forest. As there is a close correspondence between rainfall and vegetation, irregularities in rainfall amount and increasing temperature reduce the forest cover. ST communities usually collect NTFPs including herbal medicines, and do afforestation as well. Restrictions imposed on entry into the forest area were somewhat eased with FRA 2006, but the forest cover itself has reduced substantially from 2001 to 2011. Reduction in forest cover affects transpiration and soil degradation. Soil degradation restricts seed replacement techniques, as infertile soil is not suitable for cultivation of majority of cereals or pulses.

Intrinsic vulnerability of groundwater is a natural function of hydrogeological factors like characteristics of the underlying aquifer, overlying soil and geological material. In Kavant, Chhota Udepur and Nasvadi *talukas*, groundwater is dependent on nature of underlying formation, average annual rainfall and flow path. Generally, in hard rock areas of the eastern part of the District, the groundwater is available in shallow aquifers and moves from recharge area to discharge area of Narmada-Mahi doab alluvium plain of the south and south-western parts of the District, leaving the Vindhyan Hill Ranges region in a semi-arid condition and Orsang-Heran Plains as a water-logged area.

The topography of the region, being part of the western margin of the Peninsular Plateau is mostly undulating, is suitable for the cultivation of a coarse-variety of food crops and cotton as a cash crop. For example, irrigated paddy is suitable only in the four months of the rainy season and unirrigated paddy gives less yield. Likewise, cotton needs more gestation period which marginal and small farmers cannot afford.

Floods occur in the Orsang-Heran Plains region in the rainy season. The rivers overflow with water gushing down the hills. Vindhyan Hill Ranges region is incapable to hold the rain water, leaving it in a semi-arid condition. It can be comprehensively said that the multiple dependence of the tribes on their immediate surrounding has reduced.

The traditional agricultural pattern is changing in terms of cropping patterns in the tribal districts of Gujarat. Dry black to medium black soil dominates the soil types in the eastern part of the State. The overall Nitrogen-Phosphorus-Potash (NPK) status in Gujarat is low, medium and high respectively. Due to intensive farming, less leguminous plant culture and less addition of farmyard manure, the condition of coarse texture of soil with low content in iron, zinc and sulphur

accelerates. Copper content in the soil is adequately sufficient in most of the soils of Gujarat. Maize, Paddy, Sorghum as cereal and Cotton as commercial crops dominate the crop types.

Area under total cereals and pulses remain unchanged or marginally decreased in most of the districts except in Vadodara and Surat. These two districts show sharp decline in area under all cereals and pulses. The study finds that cultivated area under pulses, vegetables and oilseeds of the ST farmers has not increased much. Perhaps this is due to decreasing interest of the ST population in crop cultivation and increasing participation in non-farm activities.

General land use as well as agricultural land use have gone through alterations in Chhota Udepur district too. Significant reduction in the forest area in majority of *talukas* is a matter of serious concern not only from the point of view of the environment in general, but also from the point of view of the life and livelihood of the tribes in particular, who always had a symbiotic relationship with the forest and its resources. Within a span of 10 years, forest area in the three *talukas* of Chhota Udepur, Kavant and Jetpur Pavi has reduced from 75 to 100 per cent to 50 to 70 per cent. Grasses collected from the *Vidis* are an important source of livelihood for tribal farmers in the eastern region as well as in Chhota Udepur district. In summer months, the fodder can be collected from public grass godowns. Percentages of grass collection from Chhota Udepur district was reduced from 7 per cent in 2016-17 to nearly 1.60 per cent in 2020-21. Overall percentage of grass collection for the entire State has increased from 207.18 to 323.19 per cent in the same period.

Fragmented land holdings and rain fed farming do not allow tribal farmers to produce sufficient crops to make a major position in the State. According to Agricultural Statistics, Chhota Udepur district hardly takes any position as a major producing district of important crops.

Pre-harvest treatment with chemicals, though an important vision of the Ministry of Food and Agriculture, it deteriorates soil health if done without proper knowledge, water and adequate land.

Temporal change in the number of operational holdings of tribal population in all the five *talukas* of Chhota Udepur district show a declining trend. Per capita holdings of all the land size classes have reduced or increased marginally in all the *talukas*, perhaps due to a reduction in the number of holdings and cultivators. except in the Nasvadi *taluka*, where the number of cultivators has increased. Except Chhota Udepur and Kavant, all other *talukas* show per capita holdings

between 0.15 to 0.30 hectares. In Chhota Udepur and Kavant, the per capita operational holdings are more than 0.60 hectares. Jetpur Pavi (0.15) followed by Sankheda (0.27) have smaller per capita holdings possessed by individual farmers.

The decreasing number and area of operational holdings of all size classes from 1995-96 to 2015-16, indicates increasing population pressure on land. Seasonal out migrations from the District in search of remunerative avenues in the neighbouring districts and urban centers may be related to this situation.

The next important observation regarding land use category of the study area is, 85 to 90 per cent of cultivated area in all the *talukas* of the District during all the five time periods in reference is operated under small (1 to 1.99 ha.) to medium (4.0 to 9.99 ha.) sized land holdings. Besides, the proportion of area to total area of all holdings of the marginal and small holdings in all the *talukas* has been increasing, and the same for the larger land size categories is decreasing. The dual critical situation regarding the number and area of operational holding depicts that on the one hand there are different schemes and programmes which require more operational area, more inputs, more durable capital for improving the output, on the other hand, small per capita land holdings, fragmented operational holdings, semi-arid climate, less rainfall and poverty are stagnating production and impoverishing the farmers.

Around 74 per cent of total cultivated area in Chhota Udepur *taluka* are of marginal, small and semi-medium size. This percentage for Jetpur Pavi, Kavant, Nasvadi and Sankheda *talukas* are 88, 72, 69 and 76 per cent respectively. NSA under medium and large land size classes (4 to 10+ ha) is 25 per cent of the total NSA. On the whole, share of NSA in the total area of all the *talukas* has registered decrease during 1995-96 to 2015-16. This may be due to loss of agricultural land to other type of land uses during the recent years.

In Chhota Udepur *taluka*, large holdings have a higher share of irrigated area than other land size classes. After commencement of Narmada Irrigation Project, a large part of Sankheda and western parts of Nasvadi *talukas* benefited immensely resulting in a big change in the overall irrigated land. Irrigation is hardly showing any improvement in Kavant, Chhota Udepur and eastern part of Nasvadi *talukas*. However, considering the entire District, specific vulnerability becomes a more significant concern. Kavant, Chhota Udepur and the eastern part of Nasvadi

*talukas* fall short of required water for irrigation for nearly 8 months and the average annual rainfall is also less than 1,000 mm. In Sankheda and the western part of Nasvadi *talukas*, specific vulnerability of groundwater which originates due to urbanization and industrialization, induces water logging and salinity, which makes it unsuitable for irrigation.

Though parts of Nasvadi and Jetpur Pavi *talukas* have achieved good progress regarding canal and well irrigation respectively, Chhota Udepur, Kavant Jetpur Pavi and Nasvadi *talukas* face acute shortage of water, as the ground water level goes deep down during the dry season. Only a handful of big farmers are able to extract water with the help of electric pumps. As observed earlier, the majority of farmers of these *talukas* belong to the marginal, small and semi-medium landowner categories, who find capital intensive farming difficult.

Increase or higher percentage of GCA reflects, efficient management of the land resources. However, in Chhota Udepur district, area cropped more than once did not increase much. In 2015-16, total GCA of Chhota Udepur district was 98,127 hectares, with only ??? per cent cropping intensity. Rain fed farming permits crop production only in the *kharif* season. But, irrigated farming is input intensive and yield should compensate for the capital input. Rain fed farming in the District except in Sankheda and western parts of Nasvadi *taluka* induces less farm mechanization, less scientific agricultural practices, and non-availability of migrant farm labourers in the *rabi* and summer seasons.

As there is not much increase in GCA, profit from the agricultural produce perhaps is not enough to roll the capital-intensive inputs. For survival, tribal farmers have to move on as tribal migrants. It is surprising to note that despite having canal irrigation facility, Sankheda *taluka* had the lowest total cultivated area of 15.5 per cent, while Kavant *taluka* without irrigation facility had the highest total cultivated area of 17.8 per cent during 2018-19. Despite being equipped with canal irrigation and capital of the large size farm owners, Sankheda *taluka* has the lowest total cultivated area may be due to scarcity of farm labourers.

Information from the field survey depicts that the three different physiographic regions of Vindhyan Hill Ranges, Orsang-Heran Plains and Narmada Gorge have varying proportions of arable land left unused. The reason for this unattended land mostly in the *rabi* and summer seasons are due to less amount of water availability, lack of dry farming and scarcity of labour.

It is quite evident that availability of irrigation controls crop selection in Chhota Udepur district. Arable lands of the land owner households in sample villages like Ferkuva, Achhala of Vindhyan Hill Ranges, Dholivav and Vadadli of Orsang-Heran Plains, and Lavakoi of Narmada Gorge region remain completely unutilized during the entire summer season (March-June). Surprisingly in all the three regions, some percentage of arable land is left unutilized even during the *kharif* season, mostly due to poor water management, for example, overflowing of rivers in Kavant *taluka* and water logging in Nasvadi *taluka*.

Along with unutilized land due to lack of irrigation, there are land size category-wise differences in accessibility to irrigated water. The condition of irrigation in Vindhyan Hill Ranges region is not so good as only 50 to 85 per cent of land owner households are with irrigated land. But for them also they could cultivate 60 to 90 per cent of their land with irrigated water and in some cases the percentage of irrigated area to total cropped area is as low as only 57.5 per cent. This condition completely describes the dependence on rain fed farming and out-migration in search of livelihood. Narmada Gorge region has more or less equal share of households possessing irrigated and unirrigated land, except in Borchapada village. Here only 60 per cent cropped area is irrigated which is owned by only 52 per cent of households. With the development of well irrigation, 65 to 75 per cent of households are getting their 61 to 90 per cent of cropped area irrigated. Not only there are higher percentage (90 to 100 %) of households are having irrigated land in Orsang-Heran Plains, but also extent of their total irrigated land in the total cropped area is very high ranging between 91 to 100 percent.

Dry crops are the most dominant crops in the eastern and central hilly part of the District, where wells are the major source of irrigation. While unirrigated paddy, *Tuar* (Pigeon Pea), *bajra* and Cotton appear to be the most dominant crops of the eastern and central hilly tracts, the irrigated plains of the western margin of the District grow *jowar*, Tobacco, Castor and Sugarcane.

Maize (Corn) is grown in all the *talukas* as the main *kharif* crop, except in Sankheda, followed by irrigated paddy and Wheat. *Mung* (Green Gram), *Tuar* and *Urad* (Black Gram) are important pulses grown in all *talukas* except in Bodeli and Sankheda. Major cash crops for the main *kharif* season are Banana, Cotton, Chilli and *Arenda* (Castor Bean). Soybean is cultivated in Bodeli. This is a newly introduced *kharif* crop in the District. Out of all main *kharif* crops, Maize and *Tuar* as food crops and Cotton as cash crops are very important for tribal farmers in the District.

For the limited 4 months of the rainy season, they produce Maize and *Tuar* for subsistence and Cotton for sale. To support the demand of food and enhance the surplus income, the dry river bed is utilized in the District, following river bed farming method.

Cropping intensity of all the land size categories of every *taluka* in the District is 100 or close to 100, except in cases of some large and medium size land owners. This scenario of the cropping intensity from all *talukas* validates single cropping, and use of irrigation by the larger land owners for cultivation of *rabi* crop. Observation from the field survey is alarming, as even a few marginal farmers are practicing double crop farming with indiscriminate use of groundwater, chemical fertilizers and pesticides in all physiographic regions. These findings validate the two hypotheses proposed at the outset of the study which state that;

- "The multiple dependence of the tribes on their immediate surrounding has reduced substantially".
- "Lack of alternative economic avenues and near complete dependence on agriculture has left a large segment of the tribal population impoverished and has compelled them to migrate out seasonally mostly to the nearby urban areas in search of sustaining opportunities".

A debate arises related to justification of long run sustainability or short-term yield for the tribal farming. Small farm sizes with no increase in number and lesser use of fertilizer would direct towards good sustainability of agriculture, but with lower yield. Conversely if both area and number of holding size increase without comprehensive understanding of agricultural inputs, there will be increased productivity but deterioration of soil fertility in the long run. Such degraded soil in the long run can enhance area specific soil quality issues.

Capital, land and labour together affect crop production. To assess the assumption of the research that tribal farmers are completely dependent on agriculture, work participation scenario among the tribal population of the study area was studied.

Availability of a smaller number of main work opportunities may eventually reduce the income of tribal farmers and increase the dependence on out-migration. Although since the last 50 years agriculture has remained the dominant sector in terms of absorption of workers compared to the other two sectors (secondary and tertiary sectors), the share of primary sector in total employment has been going down in the entire State. Since 1981, the percentage share of main

workers to total workers is following a reducing trend in the Chhota Udepur district. Main workers are supposed to attend the workplace throughout the entire year. But due to rain fed farming in the District for around 120 days, tribal farmers remain unemployed during the rest of the year. Due to increase in population and dearth of permanent jobs, they depend on periodic labour jobs by migrating out.

Primarily due to yield stagnation and irrigation problems, the agricultural system has reached a plateau and there is a decreasing trend in the number of both male and female cultivators. When the respective *taluka*-wise percentages of male and female agricultural labourers are observed, the percentage of agricultural labourers have increased during the last 50 years and the trend of increase is rather stable for female agricultural labourers.

The major issue is associated with farmers with only 1 hectare to a maximum of 2 hectares of land for cultivation or share-cropping. In the absence of work opportunities after the four *khariif* months in the agricultural sector, such farmers take up wage labour as marginal workers mostly by migrating out. Marginal worker participation rates in Chhota Udepur district during 1981 and 2011 have increased by 8.3 per cent due to reduced farm job opportunities and insufficient crop production.

The situation of tribal women workforce in the entire District reveals an increasing trend in the number as marginal farm labourers rather than cultivators. Though there is a balanced sex ratio across the District, the advantages of involving female farm labourers in taking decisions pertaining to economic pursuits of the family are not fully realized. From the socio-economic point of view, women in households with higher consumption expenditure are less likely to be economically active as compared to women from lower household consumption expenditure. Withdrawal of female workers as main workers is an outcome of additional income generation from the periodic migration of female marginal farmers.

Out of the total sample households of Orsang-Heran Plains, the percentage share of workers working within the village, for all land sizes, ranges between 86 to 100 per cent. Between 4 to 33 per cent of households from across all land sizes reported seasonal out-migration. From the fully tribal not so developed Ferkuva village in Vindhyan Hill Ranges region, members of 60 per cent of sample households are migrating out in the off season for farming. Similar trends are

also observed in case of the other three villages of the region. A better condition could be observed in Narmada Gorge region as most of the villages of the region by and large display similar share of households for all places of work including places outside the village.

Disguised unemployment of labour is the main characteristic of the District. Most of the sample villages display negligence of female literacy and female work participation as cultivators or decision makers.

The general traditional tribal livelihood has gone through a tremendous change over the last decades. The aspirations of their life and their way of thinking have changed from an egalitarian perspective to a profit oriented one. As there is decreasing return from diminishing GCA, and dearth of job opportunities in the non-agrarian sectors, tribal farmers leave their community and village and move out in search of work. Their way of thinking towards natural resources like forest, river, wild animals and development were stereotyped but with sustainability. For restoring their authentic habitat in and around forest and natural regions and to make them more involved in farming with traditional wisdom supported by modern scientific methods, Central and State governments have come up with many development projects. Some of the programmes are the following.

Under the supervision of Tribal Sub-Plan and Gujarat Tribal Development Corporation, there are many important schemes like Capital Contribution Fund Scheme. This scheme provides loan for,

- i. Consumer activities of tribes
- ii. Supply of agricultural inputs
- iii. Sale and purchase of surplus agricultural products of tribal farmers
- iv. Collection of major forest produce
- v. Fixed and working capital for industrial activities
- vi. Grant of loan to individual tribals for the purchase of milk cattle and bullocks
- vii. Purchase of tractors
- viii. Margin money for the purchase of auto-rickshaw
- ix. Individual and family-oriented schemes of various departments like Rural Development, Agriculture, Animal Husbandry, etc.

Besides, there are innumerable schemes targeting,

Construction of check dams

Introduction of Micro Irrigation System

MGNREGA for assured income along with afforestation

Direct Benefit Transfer

Soil Health Card

Minimum Support Price

Jyoti Gram Yojana

Ujjwala Yojana

Pradhan Mantri Awas Yojana

But the problem lies with the ignorance of the correct information regarding these plans and policies among the tribal farmers. Due to ignorance and excessive urge to get more income, tribal farmers are ruining away from their traditional habitat. Indiscriminate uses of chemical fertilizers, unauthorized sand mining from the river beds and extractions of groundwater for irrigation are destroying their long run sustainability of farming.

Periodic migration does of course enhance their income, but promotes hierarchical class formations destroying the former egalitarian set up, which establish the third hypothesis of the study that "Traditional cultural activities authenticity has changed under the influence of urbanization and industrialization". Use of electrical and digital gadgets by members of the tribal households has now become very common. Their customary folklore, *Gram Sabhas* and inherited wisdom are being forgotten especially by the new generation as modern gadgets like television, mobile phones, and internet eat up much of their leisure time. Previously constraints posed by natural calamities or any other cause were considered as problems of the entire community. Today they are regarded as individual household problems. Tribal migrants are influenced by non-tribal ways of living, adversely impacting the socio-economic characteristics of the tribes. Most of the tribal population is perhaps benefitted from the government-initiated programmes and policies but they are losing their socio-economic values and urge to struggle for their existence. Increasing

transformation from their original forest-based economy to commercial crop cultivation has gravitated their life towards urban way of living. Restrictions imposed on the use of forest resources have turned them to live a dual life as farmers and migrant labourers, and ultimately head towards the urban centres. Lower levels of income and expenditure inequalities in the predominantly tribal regions of Vindhyan Hill Ranges and Narmada Gorge, indicate survival of egalitarian formations even to this day in these two regions. But in the Orsang-Heran Plains region, typical income inequalities are prevalent between tribal and non-tribal communities.

### **8.3 Suggestions:**

The study comprehends the equation between land holding and farmers in the tribal regions of Gujarat. Consistent transformation of tribal livelihood in terms of income, infrastructure, urbanization, literacy and education, input management and control, introduction of regulated market for crops and most significantly work participation scenario, could provide appropriate solutions to the problems faced by the tribes. Major concern for farmers in tribal area are, fragmentation of land holdings, lack of agricultural surplus and resultant insufficient income generation.

Tribal culture as well as tribal farming, both are intrinsically interwoven with the geography, particularly the physical base of the habitat. Apart from physical background of the tribal farming, there are many socio-economic conditions which influence the tribal economy. The socio-economic condition of the tribes and their households have changed during the last few decades. But there is a gap between the tribes and other social groups. Small landholding, excess use of chemical fertilizers, lack of crop diversity along with seasonal migration enhances problems of tribal farming.

Tribal farmers need hands-on training and awareness workshops for farm inputs. The best option for a comprehensive input management programme could be adoption of area/milieu specific approach in tribal area development planning. Every step towards development of tribes and their farming practices must be organized and executed jointly by state, local and *Panchayat* administration with scientists, programme planners and NGOs.

The researcher expects success in solving the problems of the tribes through the adoption of a holistic approach involving parameters of Geography, Regional Planning, Rural Development, Agricultural Science, Economics and Sociology. Based on the observations and conclusions of the study, consideration of the following suggestions may be useful.

- The responsibility to improve the scope of agriculture in tribal districts is not only limited to administrators and planners, but also lies in the hands of farmers/labourers themselves, whose awareness regarding the prospects and the modalities to achieve them needs to be enhanced through concerted efforts.
- Formulation of programmes and schemes for the development of tribes and tribal areas must take into consideration livelihood of smaller size land owning farmers.
- There should be well developed connectivity between rural and urban agriculture markets. This will help farmers to diversify, start dairy farming and horticulture with access to the markets within reasonable time and with least cost incurred.
- The physical resource base of the tribal regions pertaining to soil, groundwater and agro-climate regions must be considered while selecting crops and water management techniques to facilitate appropriate food and/or commercial crop cultivation.
- Skill development and entrepreneurship workshops should be conducted from time to time to facilitate farmers to develop new and innovative income generative activities, in addition to the benefits received from MGNREGA.
- Internet availability and connectivity in the backward *talukas* of the District must be improved to enable the farmers to take advantage of on-line resources. This will help farmers meet and discuss online important issues and find their solutions. Achievements in farming in similar ecological conditions in the different parts of the country may give added knowledge.
- DBT surveillance can put a check on intermediaries.
- To regularize micro irrigation projects and make them cost-effective, formation of cooperatives among tribal farmers have been initiated by the government. Efforts should be made to make the tribal farmers more aware about the initiative.
- Utilization of conventional sources of energy like electricity or diesel to irrigate the fields is expensive. Efforts should be made to popularize the use of non-conventional sources like

solar energy among the tribal farmers and facilitate them. Endorsing and popularizing solar energy can decrease the additional cost and maintain ecological harmony.

- To introduce the modern technologies of farming to the farmers, SHG groups can take initiative and educate the farmers about them. As most of the marginal and small farmers in the summer months move out of the villages they are missing out on administration driven awareness programmes.
- Regular and time to time verification of different tribal development plans and programmes after execution by competent agencies is essential to assess their success. It has been observed during the field survey that the drinking water supply system through taps in the sample villages have mostly been dysfunctional. Follow up verifications can be of great help in the matter.
- Tribal migrants may be provided with identity cards to enable them to get benefits of the PDS at the place of migration.
- Tribal youths, both boys and girls, should be imparted knowledge on sustainable resource management.
- Knowledge regarding value added products can increase the farmer's income. Infrastructure like cold storage, packing units and labelling units could also create new job opportunities.
- Farmers of Chhota Udepur, Jetpur Pavi, Nasvadi and Bodeli *talukas* are producing considerable amounts of vegetables. There is a huge demand of fruits and vegetables like Broccoli, Celery, Colourful Bell Pepper these days. With the specific training and hands on work experiences on the said vegetable cultivation, tribal farmers possibly could go for these vegetables and sell them to earn extra income.

#### **8.4 Limitation of the Study:**

To achieve the set the objectives of this study, getting data from both secondary and primary sources posed major hurdles. Specially, secondary data at micro level is generally not available. To overcome the hurdle, the researcher had to depend on predicted data. During the primary investigation, tribal farmers were less responsive due to lack of understanding and sometimes were not able to provide estimates of farm inputs. Periodic migration and consequential detachment

from the farming processes have adversely affected the understanding of the tribal farmers regarding the latter. They are not able to recapitulate what inputs they have used in the rainy season at the end of the year. With great difficulty and persuasions, the researcher could generate relevant primary information during the field survey.

Perhaps there are a few areas of the research where spatial investigation absorbed enough time so further in-depth analysis could not possible. A few areas of observation needed more in-depth research like changes in forest density, impact of particular soil type to the particular tribal area development.

### **8.5 Future Scope of the Study:**

Knowledge has no horizon. It is naive to expect reaching the horizon of knowledge. Research of any kind, on any issue, in any discipline can only further knowledge. Hence, research is an on-going process, through which knowledge keeps on accumulating, and many times unravelling more and more facts about what is already known. The present research on the problems and prospects of agriculture in the tribal areas referring to a small segment the tribal belt of Gujarat, is a modest attempt in that direction. Without the constraints of time, finance and man power, the research could have attempted to investigate some more spatial aspects pertaining to the issue in hand, such as the following.

- Issues pertaining to soils of the tribal territories and their crop-wise suitability.
- Possibility of introducing economic avenues such as horticulture, pisciculture, apiculture, food processing and packaging etcetera as alternative to crop cultivation in a specific tribal village or a group of villages.
- Causes and consequences of seasonal out migration of population in the working age.
- Effects of the plans, programmes and schemes on ecological, social, demographic and economic aspects of the tribes.
- Consequences of interaction of the tribes with the non-tribes.

The researcher optimistically feels that the issues stated above can be addressed by herself or by other researchers in the future. These are some of the highly crucial areas for social scientists in general and geographers in particular to be taken up as research endeavours.

Hope the Almighty shall bestow His blessings upon the tribal and other deprived segments of the country's population.