

## CHAPTER IX

### SUMMARY, CONCLUSION AND SUGGESTIONS

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#### 9.1 Summary and Conclusion:

The relationship between man and environment has always been major concern of the subject geography and geographers. Environmental factors determine physical and mental health of human being. Physiography plays an important role on landuse and productivity of land. Jalgaon district belongs to the *Deccan* uplands of the Maharashtra State. It has distinguished characteristic from the rest of the upland districts due to its westward aspect. The study region include large hills in the northern part known as Satpuda mountain covered with thick forest, stretches of barren plain and bad land topography along the major river banks. Tapi trough is well known rift system occurring between Satpuda range to the north and steep rising Satmala Ajanta range to the south. The Satmala-Ajanta range demarcates the southern boundary of the Tapi basin as well of Jalgaon district.

The drainage pattern in the study region is dendritic in nature. Tapi is the major river flowing in the east-west direction. Since the study region lies far away from the sea coast, it experiences continental type of climate. It has the Tropical monsoon climate. The study region receives rain mainly from south-west monsoon, begins in the middle of June and lasts till the end of September. Bulk of the rainfall, however, is received during the months of the July and August. The study region lies away from the coast and has relatively low altitude, summer temperature is very high.

In Jalgaon district regur roomed from solidified lava e.g. basalt and its deposition in the form of alluvium in river valleys have created a favorable edaphic condition for successful agricultural activities. Deep black, medium black and coarse black soils are generally observed in the study region.

During the decade 2001-11 the total population of the study region has increased by 14.86 percent. The highest growth of the population is recorded in Ranjangaon PHC region followed by Tarwade from Chalisgaon tehsil, Kinhi from Bhusawal and Vaijapur tribal PHC region from Chopda tehsil. While, negative growth of population has been recorded in Girad PHC region from Bhadgaon tehsil, followed by Yengaon from Bodwad, Ruikhede from Muktainager, Patonda from Chalisgaon, Chahardi from Chopda tehsil, Thorgavan from Raver tehsil and Bhalod PHC region from Yawal tehsil.

There is wide variation in density of population at PHC level of the study region. The highest density is recorded in Hingone PHC region of Yawal tehsil, while the lowest density has been recorded in Ranjangaon PHC region.

The lowest sex ratio is observed in Patonda (856) PHC region of Chalisgaon tehsil. In the central part of the district in many PHC regions sex ratio is ranging between 900 and 925 females, while in the northern tehsil PHC regions it is observed between 925 to 950 females. The highest sex ratio is recorded at Vaijapur tribal PHC (985) region from Chopda tehsil.

According to 2011 census 79.73 percent of total population of the study region is literate which is lower than the state average of Maharashtra. The highest literacy is observed in Varangaon PHC region

of Bhusawal tehsil. However, the lowest literacy rate is observed at Vaijapur tribal PHC region from Chopda tehsil followed by Lohara tribal PHC region from Raver tehsil.

Agriculture is the main sector of the economic activities in the study region. The main cultivators and main agricultural labourers altogether constitute more than 71 percent of the total main workers in the district. The highest concentration of cultivators is observed in Tamaswadi PHC region of Parola tehsil, while it is lowest in Varangaon PHC region of Bhusawal tehsil. The proportion of agricultural labourers to total workers varies between 79.50 percent in Vaijapur tribal PHC region of Chopda tehsil and 37.58 percent in Varangaon PHC region of Bhusawal tehsil.

Scheduled caste population in the district has registered 35.74 percent growth during 2001-11 decade against the growth of total population 14.86 percent. It is found that four PHC regions viz. Padalse (Yawal), Girad (Bhadgaon), Patonda (Chalisingaon) and Nandra (Pachora) have shown negative growth in scheduled caste population during the decade 2001-11. On the contrary rapid growth has been observed in some PHC regions viz. Kurha (181.60%) and Uchande (154.74%) from Muktainager, Phattepur (128.58%) and Betawad (107.29%) from Jamner and Yeoti PHC region (119.11%) from Bodwad tehsil. The proportion of scheduled caste to total population displays a striking range of 2.07 percent in Vaijapur PHC region (Chopda) to 17.60 percent in Uchanda PHC region (Muktainager). The highest concentration index i.e. 1.91 is recorded in Uchanda PHC region while the lowest concentration index 0.22 is observed in Vaijapur PHC region from Chopda tehsil which is dominated by tribal population. The average density of the study region

for scheduled caste population is 36 persons per sq. km. The highest density of scheduled caste population is observed at Varangaon PHC region of Bhusawal tehsil (101 persons/km<sup>2</sup>) while the lowest is found at Vaijapur from Chopda and Ranjangaon PHC region from Chalisgaon tehsil (11persons/km<sup>2</sup>). Average sex ratio of scheduled caste population is 952 in the district. Sex ratio is the highest (1017) in Chinawal PHC region (Raver) while it is the lowest at Talegaon PHC region (868) from Chalisgaon tehsil.

Scheduled tribe population in the district has registered 38.63 percent growth during 2001-11. The highest increase in the scheduled tribe population is recorded in Ranjangaon PHC region (133.21%) from Chalisgaon tehsil, whereas it is the lowest in Yengaon PHC region (-8.15%) from Bodwad tehsil. The proportion of tribal communities to total population displays different type of range, the minimum 6.08 percent at Lohara PHC region (Pachora) and the maximum proportion 79.60 percent in Vaijapur PHC region (Chopda). The highest concentration index is recorded in the tribal PHC region Vaijapur (5.65), while the lowest is recorded at Shendurni (0.46) in Jamner tehsil. The average density of the study region for scheduled tribe population is 56persons/km<sup>2</sup>. However, there is marked variation in the density among the PHC regions. It is observed that, Vaijapur PHC region of Chopda tehsil have the highest density (423 persons/km<sup>2</sup>) while the lowest (13persons/km<sup>2</sup>) is found at Yengaon from Bodwad and Lohara PHC region from Pachora tehsil. Average sex ratio of scheduled tribe population is 949 females per 1000 males. The highest sex ratio among all PHC regions of the district is recorded at Londhe PHC region (1064) while the lowest is recorded at Patonda PHC region (817) both are from Chalisgaon tehsil of the district.

Large area under forest cover is occupied in the northern tehsils of the district namely Yawal, Raver, Bhusawal, Chopda. As the result net sown area in the Yawal and Bhusawal tehsil is low as compared to other tehsils of the district. The proportion of the forest area varies from 34.88 percent in Yawal tehsil to 2.26 percent in Amalner tehsil. About 5.48 percent of the area of the Jalgaon district is not available for cultivation. It is observed that very high proportion of such land is found at Muktainager (15.33 %) and only 0.97 percent the least proportion is found at Yawal tehsil. About 4.87 percent of the area of the district is included under grazing and cultivable waste land. High proportion of this land use is observed in Bhadgaon tehsil (12.76%) while Dharangaon tehsil has shown the least proportion (0.79 %) under grazing and cultivable waste. The area under fallow land is about 1.92 percent in the study region. The proportion of fallow land is higher in Bhusawal tehsil (6.43%) and the least proportion (0.25 %) is reported in Muktainager tehsil. About 68.97 percent of the total area of the district is under cultivation. Net sown area occupies the highest proportion in Dharangaon tehsil i.e. 89.68 percent. It is the lowest observed in the Yawal tehsil having 56.08 percent only. Spatial variations among different categories of land use are mainly attributed to the variations in physiographic characteristics particularly relief and rainfall.

Jowar, bajra, corn and wheat are the major cereals grown in the study region. Cereals altogether occupied 216202.72 hectare of gross cropped area, which accounts 27.58 percent during the study period. Jowar occupied 117905.51 hectare of area which is 15.04 percent to the gross cropped area. Jowar occupies more area than any other cereal crop in the study region. Among the cereals, bajra stands second and grown on 44061.13 hectares area of the district. About 5.62 percent of the total

gross cropped area is under bajra. Considering the area after bajra, corn is the third ranking cereal crop in the study region grown on 34048.10 hectare area. Out of gross cropped area of the district about 4.34 percent is under corn cultivation. Out of the gross cropped area, about 20187.98 hectares (2.58%) is devoted to the wheat. Pulses rank second after cereals among the food crops in the district and occupied 89673 hectare of area which is 11.44 percent to the gross cropped area during the study period. Oilseeds cultivated on 25591.90 hectare occupied 3.27 percent area. There was 5586.75 hectares of land under cultivation of vegetable during the reference period accounts for 0.71 percent to gross cropped area of the district.

Food production provides the base for food security as it is a key determinant of food availability. It is observed that production of jowar ranks first among the cereals in the study region. The production of pulses is also remarkable in the district. Availability of cereals in the PHC regions is around 434 gm per head per day. However, it is lower than the standard requirement. Among the cereals average availability of jowar is 250 gm, availability of corn is 85.47 gm, availability of bajra is 47.64 gm, and average availability of wheat in the study region is 50.80 gm per head per day. The average availability of pulses for all PHC regions is 278.35 gm per day per person. Availability of pulses is on very higher side; however there is large variation among the different PHC regions.

Overall potentiality of the land has been identified with the techniques of nutritional and caloric density for all PHC regions. The average nutritional density for all the PHC regions is 387 persons per km<sup>2</sup> of gross cropped area. The nutritional density ranges between 204 persons in Vaijapur PHC region from Chopda and 2020 persons in Kinhi PHC region from Bhusawal tehsil. The average caloric density for all

PHC regions is 915 persons per km<sup>2</sup>. However, there is large variation among the PHC's. The caloric density ranges between 4925 in Hingona PHC region from Yawal tehsil and 388 in Dheku PHC region of Amalner tehsil.

It is observed that, the whole region is deficit by 73.34 Kcal (3.06 %) in terms of availability of calories. There are forty-three PHC regions deficit in calories. About 62 percent of the scheduled caste and scheduled tribe population is facing the problems of caloric deficiency.

There are seventeen PHC regions of the study region are deficit in terms of protein availability. In these PHC regions more than 23 percent scheduled caste and scheduled tribe population is concentrated. The proportion of scheduled caste population is higher than the scheduled tribe population in the protein deficiency region.

In the study region per head per day availability of fats is 17.08 gm which is less by 31.68 percent than the recommended. There are sixty-five PHC regions are deficit in terms of availability of fats. In these deficits PHC regions totally 86.51 percent scheduled caste and scheduled tribe population is settled.

The study region as a whole is deficit in carbohydrates availability. Forty-three PHC regions are deficit in terms of availability of carbohydrates and about 62 percent scheduled caste and scheduled tribe population is facing the problems of carbohydrates deficiency.

In the study region per head per day availability of calcium is only 105.56 mg against the standard requirement of 400 mg, which is less by more than 73 percent than the recommended. All the scheduled caste and scheduled tribe population is deficit in terms of availability of calcium in the study region.

There are nine PHC regions of the district which have shown iron deficiency. About 11 percent of scheduled caste and scheduled tribe population of these PHC regions are facing the problem of iron deficiency.

In eight PHC regions of the district thiamine deficiency is observed. In these PHC regions about 10 percent of scheduled caste and scheduled tribe population is facing the problem of thiamine deficiency.

The study region as a whole is deficit in the availability riboflavin. Forty-one PHC regions are deficit in terms of availability of riboflavin. About 60 percent scheduled caste and scheduled tribe population is facing the problems of riboflavin and niacin deficiency.

Nutritional deficiency diseases may cause due to the partial or complex absence of one or more nutrients in the diet of the person. Nutritional deficiency is the major concern among the backward communities like scheduled caste and scheduled tribes. There are nine deficiency diseases are reported in the study region which include anemia, teeth and gum diseases, eye diseases, night blindness, malnutrition, stunted growth, goiter, pellagra, kwashiorkor etc.

Anemia ranks first among all the nutritional deficiency diseases reported to the PHC. Average intensity rate of anaemia for all PHC regions is recorded 8.78 patients per 1000 population. Highest intensity rate of anaemia is observed in Khedgaon PHC region (73.92, highest morbidity index is found in Kanalda PHC region (776.13). In Kanalda PHC region totally 47.80 percent population is from scheduled caste (10.89 percent) and scheduled tribe (36.92 percent) community. It is concluded that more number of morbidity cases of anaemia are identified in the areas of higher concentration of scheduled caste and scheduled tribe population.

Eye diseases rank second among the deficiency diseases. The intensity rate for eye diseases is 3.27 cases per 1000 population. The highest morbidity pattern (above 200) for eye diseases is observed in Nashirabad PHC region (658.05), followed by Ainpur, Kurha, Sakli, Talegaon, Shendurni, Nimbhora, Talai and Bhalod. In these nine PHC regions about 12 percent of scheduled caste and scheduled tribe population is settled.

Teeth and gum diseases are observed at an average rate of 2.55 cases per 1000 population. There are sixteen PHC regions of the district have shown high morbidity index (above 150) for teeth and gum diseases. In these PHC regions about 20 percent of scheduled caste and scheduled tribe population is concentrated. The highest morbidity index is observed in Kurha (570.26) PHC region from eastern tehsil Muktainager.

Malnutrition patients are observed at the average rate of 0.74 cases per 1000 population. High morbidity index (above 200) for malnutrition is observed in eleven PHC regions. Out of these eleven, six PHC regions are located in the northern part of the study region in Chopda, Yawal and Raver tehsils. These PHC regions are mainly dominated by scheduled tribe population.

In the study region goiter cases are reported in twelve PHC's. The goiter intensity rate in the study region is 1.65 cases per 100000 population. The concentration of goiter is observed high (above 500 morbidity index) in Adawad, Chahardi, Vaijapur, Dhanora, Kasoda and Garkhede PHC regions. Around 30.18 percent scheduled caste and scheduled tribe population is settled in these twelve PHC regions.

Stunted growth cases are observed in thirteen PHC regions of the district where 16.04 percent population from scheduled caste and scheduled tribe settled. Maximum intensity is observed in Girad PHC

region (37.61 cases/100000 population). While the maximum morbidity index for stunted growth is observed in Talegaon PHC region.

In twenty-one PHC regions of the district night blindness cases are reported. In these PHC regions 23.50 percent population from scheduled caste and scheduled tribe is settled. Highest intensity rate and morbidity index for night blindness is found at Umbarkhed (Chalisingaon) and Adawad (Chopda) PHC regions respectively.

The overall intensity rate of pellagra for the region is 1.71 cases per 100000 persons. The highest intensity occurred in Ranjangaon PHC region (82.4 cases per 100000 persons). The areas of high morbidity index of pellagra are extended over Vaijapur, Lohara (Raver), Kinhi, Ranjangaon, Talegaon, Wakli PHC regions of the district. It is concluded that the incidence of pellagra is very high in the tribal population of the region.

There are seven PHC regions in the district which have recorded kwashiorkor cases. All these seven PHC regions have totally 8.11 percent population concentration of scheduled caste (6.07%) and scheduled tribe (9.14%) communities.

To assess the dietary pattern and food habits of the population village survey has been conducted. After extensive field survey following conclusion have been pointed out. Most of the families from scheduled caste and scheduled tribe population are economically poor and have to incur larger expenditure on food items like cereals and pulses other than nutritive dietary components. Use of milk and milk products and green leafy vegetables are negligible in the daily diet of the families. Very few families can afford milk and milk products throughout the year in their diet. Majority of the families are lacking in sufficient nutrients like

protein, carbohydrates, calcium etc. Most of the nutritional diseases are observed in low income groups i.e. landless agricultural labourers.

It is found that except sugar all food items in the diet of the scheduled caste and scheduled tribe population are deficit. Average consumption of cereals by scheduled caste and scheduled tribe population in the study region is only 289.34 gm per head per day which is less by 35.70 percent. In the same way pulses, leafy vegetable, other vegetable, milk, meat and eggs are less in by 58.99, 81.39, 84.38, 59.87 and 50.98 percent respectively in the daily diet of the scheduled caste and scheduled tribe population of the study region. From the sample study of various PHC regions, it is found that nutritional status of the scheduled caste and scheduled tribe people in study region is very poor.

As the result of poor or insufficient diet of the scheduled caste and scheduled tribe population of the study region various nutrients are found deficit in the diet of the people. Calories are found deficit in all sample PHC regions. The maximum deficiency of calories is found by 45.47 percent in Vaijapur PHC region and the least deficiency is observed at Varangaon PHC region by 10.69 percent. Among the other nutrients Carbohydrates, niacin, riboflavin and vitamin 'C' are found deficit in all the sample PHC regions. Protein deficiency is observed in three sample PHC regions while remaining has very little excess of protein in the daily diet.

The calorie and carbohydrate deficiency produced some cases of marasmus in the study village. In the sample PHC regions, calories and carbohydrates deficiencies are acute. Therefore, the symptoms of marasmus are commonly observed among the scheduled caste and scheduled tribe people. Calcium deficiency in the diet of the people in

this region is also less from the standard requirement. Because of calcium deficiency tooth decay patients are mostly observed during the field survey. The proportion of tooth decay is more among the school going children. Vitamin 'C' is also deficient in the sample PHC regions. Because of high deficiency of vitamin 'C', a symptom of scurvy disease is observed in surveyed PHC region.

It is concluded that the overall nutritional status of the scheduled caste and scheduled tribe in the district is found to be poor. The socio economic condition of the population has decided the health status of the people. Among the various reasons of under nutrition and malnutrition factors like low productivity, low purchasing power and lack of knowledge about the proper diet are the causes of poor health and deficiency diseases. In view of above conclusions, the objectives and hypotheses mentioned at the beginning are tested positively.

## **9.2 Suggestions:**

- As it is clear in the present study that most of the nutritional deficiency diseases are prevailed in low income groups and it is almost impossible to increase their income suddenly. Some low cost balanced diets should be computed by re-allocating the available resources and making the diets more nutritious and balanced at the same time to alleviate the persistent malnutrition substantially.
- Landless labourers, marginal and small farmers should be given top priority in practical nutrition programmes and nutrition education.

- Plantation of fruit trees by the PWD and forest department should be initiated along the road sides. So that poor population may use these fruits.
- The productivity of land could extensively be increased by bringing more area under double cropping, reclaiming barren and fallow lands, intensifying agriculture and increasing organic matter.
- Health care facilities like PHC should be in the vicinity of the tribal settlements. So that seek person can get immediate aid from the health centre. It is to mention that PHC center Lohara is located 35 km away from the settlements like Garkhede, Nimdya located in Satpuda mountain.
- It is necessary to enhance the capability of the mother through proper nutrition education for taking care of the normal health and nutritional needs and health of the child through the programmes like ICDS and SNP.
- It is proposed to higher investment on health care, especially maternal and child care. Further there is need of expansion of training and awareness of nutrition to achieve optimum use of available and easily producible food stuffs.
- Transportation network especially in the tribal region needs to improve for better access to health care centres and speedy supply of food.