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"Demographic Development Pre and Post Watershed Development of Model Watershed Village Ralegansiddhi in Parner Tahesil"

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Abstract

While considering choice of study area before watershed development programm village Ralegansiddhi was known for various problems like water scarcity, land degradation, deforestation, lack of irrigational water for agriculture, low agriculture productivity, poverty, migration, less employment opportunities etc. Due to these problems social evils like alcohol addiction and gambling are common. All the activities in the village were focused around the liquor dens. This has leads the various socio-economic environmental problems. For promoting overall socio-economic development on sustainable basis, increase the overall agriculture production; improve the standard of living of the farmers depending on rainfed lands the watershed management programmes are implemented in village by Government, NGO, Watershed Development organizations" and social workers. Ralegansiddhi is mostly in rain shadow to the east of Western Ghat. The average annual rainfall is 400 mm which is very uncertain. Sometimes half of the rainfall occurred within one month. While study region is in south part of district, which is typically semi-arid and receives average rainfall 366 mm. (Ahmednagar District Scarcity department 2012).

Key Words: *Watershed Management, Promoting, land degradation, gambling*

Introduction

Within the past two decades, vast changes have occurred in many aspects of life in every country of the world. Perhaps the most significant is the recognition, that rapid rate of population growth influences every sector of economic and social development. Worldwide interest in the population problems evolving from rapid population growth has been promoted by two major considerations, an increasing concern about the relation between population growth and available resources and a growing awareness that unrestricted population growth tends to impose a strong constraint on the standard of living, happiness and even survival of mankind through the spiraling consumption of the fixed quantity of resources (Bhattacharjee and Shastri, 1976).

If we want to solve the water problem in rural areas and stop the mass migration of the rural people to the urban centers, watershed development is the only solution. If we plan watershed development, works well, we can save the country from water crisis in the future. For that, a village should be considered as a unit and then composite thoughts need to be given to all the watershed areas in that unit. Watershed development is a miracle which transforms the society. Watershed developments not only increase water availability of the area but also change the society. It takes social and economical transformation through various activities. Watershed development is the foundation of economic and social transformation. Watersheds developments teach earn water through hard rock, and use it for welfare of village and downtrodden community of the village to raise their social transformation. The social transformation brings the economic transformation (Anna Hajare, 2011)

Effective watershed management is also considered an appropriate approach for addressing food security and poverty alleviation. Watershed management is being seen as a major component of soil; water and vegetation cover conservation, rural communities' living standard improvement and better environmental conditions. So, watershed management is one of the important topics of this present study. For the development of a country, its natural resources must be conserved, utilized and managed properly. This can be achieved efficiently by considering watershed as a basic workable unit and it has been proved by a number of researchers (David A.Eash 1994).

Watershed management implies rational utilization of land and water resources for optimum and sustained production with the minimum of hazards to natural resources and environment. It requires collection and analysis of a great deal of information on physical relationship of vegetation-soil-water to land management which ensures economic and social progress of a region (Nagarajan. N.2012).

In India, most watershed projects are implemented with the twin objectives of soil and water conservation and enhancing the livehood of the rural poor (Sharma and Scott, 2005).For this different types of treatment activities are carried out in watershed villages like Ralegansiddi, Hiwrebajar, Darewadi, Mudgal, Shirpur, Johad etc. These model watershed villages are the best examples, and they indicate that watershed is not only tool to increase availability of water, but also watershed is the best tool of socio economic transformation of the society. But today these villages are also facing problems of scarcity of water, so there is a dire need to acquaint people with water management.

Location, Site and Situation of Ralegansiddhi :

Ralegansiddhi is one of the pioneering village, which is know as model watershed village in Maharashtra. This village is located 87 km from Pune and 15 km away from Pune- Ahmednagar highway. It is situated in Parner tahesil in Ahmednagar District. The latitudinal extent of is 18°53'21"to18°56'18"" North and longitude extent is74°22'56" to 74°25'04"' East. Ralegansiddhi is situated in a low rainfall drought-prone area of Maharashtra State – 'quoted average rainfall' of about 400-500 mm, with high variability. Its physiographic setting is the hilly part of the Deccan Traps country at the foot of an escarpment and head of a local watershed with elevation mainly in the range 755 mt. AMSL. The main occupation in the village is agriculture, though in recent times, many people have taken up a job in the military or teach in schools in order to ensure at least one steady source of income in each family. The main food crops are bajra (millet) and jowar (sorghum), while the main cash crop is onions. Also cultivated are pulses and groundnuts, vegetables such as cucumber, coriander and spinach, and occasionally, fruits. The total geographical area of the village of 982.31 hectares. The principal form of irrigation in the village is well irrigation (open wells).The population of Ralegansiddhi in 2011 census was 2365 among it 1217 males and 1148 females.

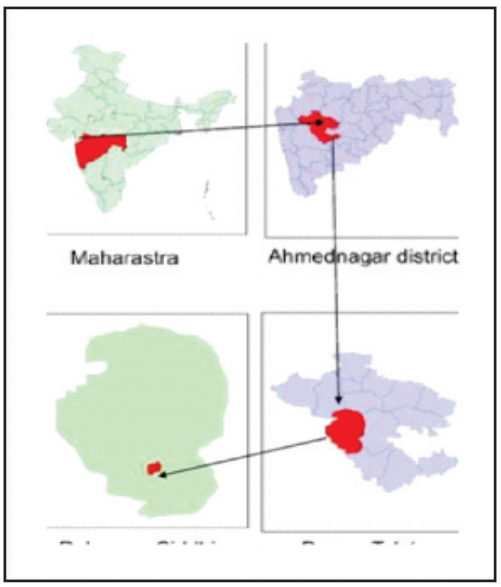

Fig. no. 1.1 Location map of Ralegansiddhi

Aims and Objectives

1. To analyze demographic characteristics of population of study area.
2. To identify impact of watershed in rural development.

Hypothesis

1. Watershed programme cannot succeed without full participation of project beneficiaries & careful attention to social organization.
2. Socio-economic development of villages depends on sustainability of water resource.

Data Source

Primary Data

Primary data is collected from the sample beneficiaries through personal interviews. For this purpose, questionnaire was prepared. For collection of data field work was done.

Secondary Data

The secondary data information is collected from record of Grampanchyat, Taluka Krushi Offices, Panchayat Samitti and Self Help Groups (SHG). Some data is collected from several published research papers and Ph.D. Theses. For collection of data, topic related books and journals are referred. For the data related to various physical, socio-economic and demographic characteristics District Census Handbooks is referred (1981-2011). Toposheets are also used as a secondary data for study purpose. In addition the researcher discussed with state government departments like Soil Conservation offices, District Groundwater Department and officials of different NGOs, Social workers and Sarpanchs of villages.

Methodology and Techniques

The present investigation aims at understanding the problems and prospective of the study area. For this purpose different aspects like physical, demographical and socio-economical setup are taken into consideration. Accordingly primary and secondary data is collected from different sources and on the same data different analytical methods are applied. In data analysis both empirical and theoretical approaches are used. Apart from this some Geographical Information System (GIS) techniques are also used for understanding ground truth. However, brief idea of the methodology adopted in the study is given in the following points.

Spatial data

Data related to the space means real world is known as spatial data. This data is collected in the form of primary and secondary data.

a. Village Survey

Regular visits are carried out to the study area for field observation. During the field survey of the study area present status of watershed development is checkout. Photography is taken of important locations of the study area.

b. GPS (Global Possessing System) Survey

GPS survey is done for all selected village watersheds to obtain the information of latitude, longitude and elevation of study area.

c. Secondary data

For the generation of base map in GIS, toposheets, tahesil cadastral maps and satellite images are used. The village Ralegansiddi of Ahmednagar districts is covered in the Survey of India toposheets numbers 47 I / 12 and16 of 1:50,000 scale. Cadastral tahesils map of census 1991 of the Nagar Tahesil is used as base maps.

All mentioned toposheets and satellite images namely IRS 1C/1B (NRSC, Hydrabad) are mosaic and details such as contour of 20 Mt. interval, drainage, tahesils and village boundaries are digitized in ArcGIS 9.3X software. Various maps are prepared including contour, drainage, stream ordering, slop and aspect. Shuttle Radar Topographic Mission (SRTM) DEM data of 30 Mt. spatial

resolutions are used to create digital elevation models of the Hivare Bazar and proposed village watershed of the study area in ArcGIS 9.3X, ERADAS IMAGINE 9.2 software.

Non spatial data

Primary and secondary non spatial data is collected from various sources for the same study.

a. Primary data

For the study sample socio-economic village survey of ideal and model watershed village is conducted. To understand the demographic, socio-economic situation of these villages of before and after watershed development stratified random sample method is used.

b. Secondary data

Secondary data such as census data, district gazetteer, handbooks socio-economic statically reports and climatic reports are collected from internet and related departments. Whole data is arranged in suitable format.

Thematic Maps

Usual cartographic techniques are used for presentation to the data. Some of the distributional maps are prepared using cartographic techniques. Further all sorts of published and non- published data is processed in Statists Package for Social Sciences v22 (SPSS) software and the suitable maps and diagrams using by the GIS and Remote Sensing techniques, represented data, several maps, graphs and pie charts are constructed.

Analysis

Above all spatial and non-spatial data is used as base information for final analysis. Simple quantities techniques like mean, percentage distribution, population growth rate, density, sex ratio, ratio proportion, crop combination method and standard living index etc. are used in the comparative approach. Water harvesting structures are made by using data collection from these sources.

Finally with the help of above thematic maps and data analysis interpretation is done.

Conclusion and Discussion

Demographic Characteristics

Population Distribution

Table No. 1.1 Distribution of total population in model watershed village Raleganssiddhi.

Sr. No.	Name of Village	1991			2001			2011		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Raleganssiddhi	1042	940	1982	1041	1265	2306	1217	1148	2365

Source: Computed by researcher (Census 1991-2011).

The table no. 1.1 shows population distribution in the Raleganssiddhi. As per the census of India 1991, total number of households and population in Raleganssiddhi. was 310 and 1982. In this census year female (940) population is less than male (1042). According to the census of India 2001 total number of households and population in Raleganssiddhi was 394 and 2306. In this census year female (1265) population is decreases as compare to the male (1041). According to the census of India 2011 total number of households and population in Raleganssiddhi. 530 and 2365. In this census year female (1148) population is decreases as compare to the male (1217).

According to the above table population of the village is increased according to increased census years.

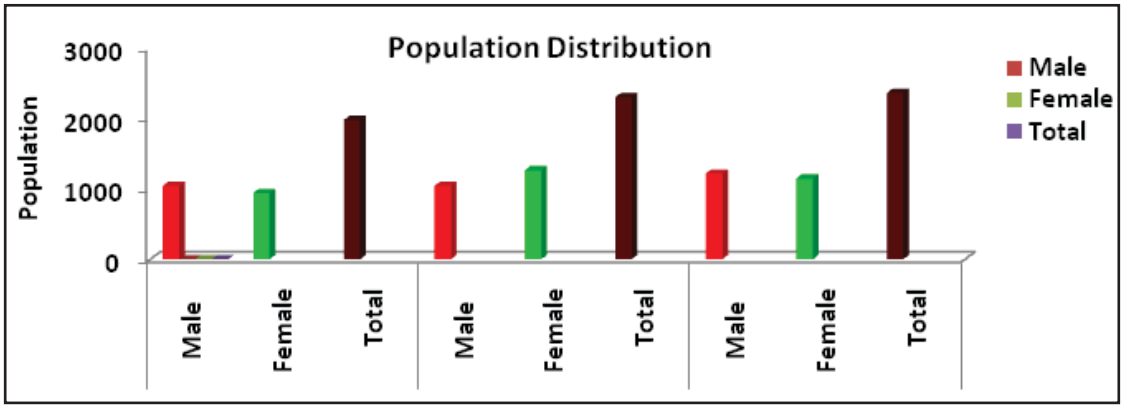

Fig. no. 1.1 Population Distributions in Raleganssiddhi (1991-2011)

Population Growth Rate

Table No. 1.2 Population growth rate of model watershed village Raleganssiddhi. .

Sr. No.	Name of Village	Population Growth (Percentage)		
		1991	2001	2011
1	**Raleganssiddhi**	31.43	16.90	2.07
2	**Ahmednagar District**	24.35	19.80	12.44

Source: Computed by researcher (Census 1991-2011).

Table no 1.2 represents population growth rate of study area. Declining trend of population growth rate is important characteristics of Indian population. This was followed by Raleganssiddhi average growth rate is declined. Population growth rate of Raleganssiddhi was decline continuously from 1991 to 2011.

Population growth rate of study area also declined continuously in Raleganssiddhi 1991 (31.43) to 2011 (2.07), and it is one of good indicator of socio-economic development due to watershed development.

In general the village Raleganssiddhi shows rapid declining trend of population growth rate due to development in way of living, increased per capita income, educational attainment, health facility and better awareness of population explosion.

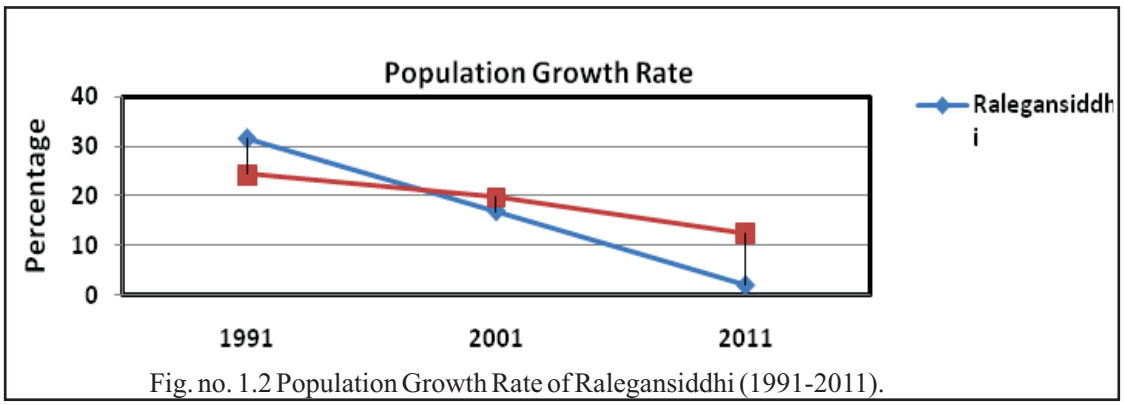

Fig. no. 1.2 Population Growth Rate of Raleganssiddhi (1991-2011).

Population Density

Table No. 1.3 Population density distribution of model watershed village Ralegoansiddhi.

Sr. No.	Name of Village	Population Density (Person /Sq. Km)		
		1991	2001	2011
1	**Raleganssiddhi**	202	236	241
2	**Ahmednagar District**	198	237	266

Source: Computed by researcher (Census 1991-2011).

Table no. 1.3 represents population density that is land man ratio of study area. As per the data population density of Raleganssiddhi increased rapidly in the last three decades, but if compared with district average density of Raleganssiddhi, it is less except 1991 census year where Raleganssiddhi. has exceed density above district average and in 2001 and 2011 census Raleganssiddhi is showing population density below Ahmednagar district.

It is clear from the data that proportion of population to the land is high in Raleganssiddhi and the population density is increased in the village by 39 Persons / Sq. Km. in the last three decades
It is found from the data that decadal increase in population density is less from 2001 to 2011 as compare with 1991 to 2001.

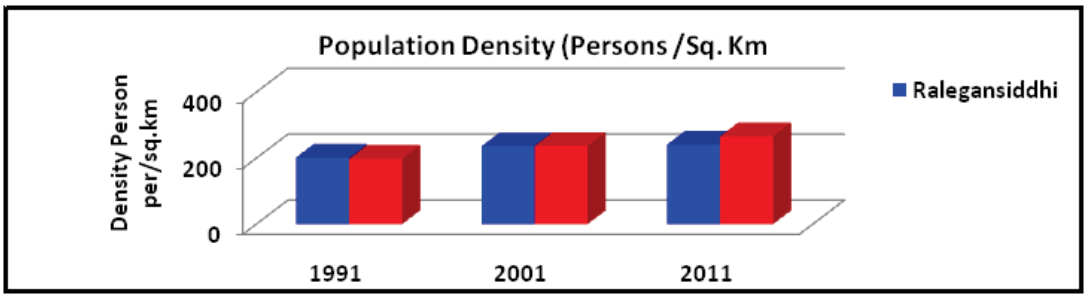

Fig. No 1.3 Population density distributions of Raleganssiddhi 1991-2001.

Sex Ratio

Table No. 1.4 Sex ratio of model watershed village Raleganssiddhi

Sr. No.	Name of Village			
		1991	**2001**	**2011**
1	**Raleganssiddhi**	903	810	943
2	**Ahmednagar District**	949	940	939

Source: Computed by researcher (Census 1991-2011).

Table no 1.4 represents sex ratio of study village which is important indicator of socio-economic development in the region. From the data it is clear that in Ahmednagar district sex ratio is declined by 10 females/ 000' males. Raleganssiddhi Shows very contrast trend . Where it declined very rapidly in 1991 to 2001(92 females/ 000' males) and again it increased in 2011 (133 females/ 000' males).

In general the increased sex ratio of the study area is a sigh of socio-economic development of the model watershed village.

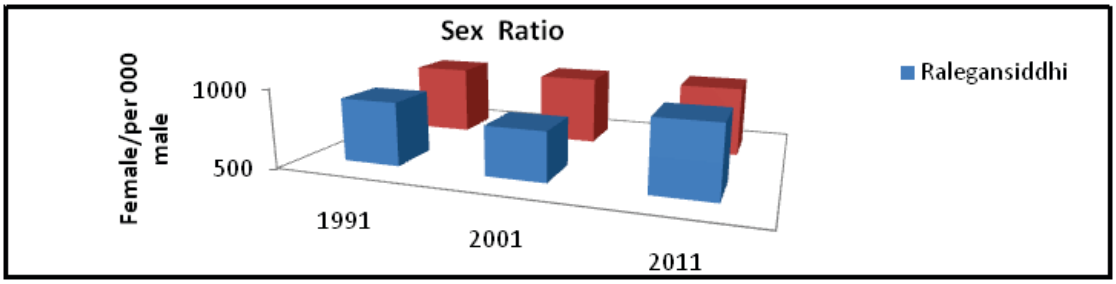

Fig. No 2.4 Population Sex Ratio of Raleganssiddhi 1991-2001.

Child Sex Ratio (0 to 6 ages)

Table No. 1.5 Child sex ratio (0 to 6) of model watershed villages

Sr. No.	Name of Village	(Female's/ '000'/ Male)		
		1991	2001	2011
1	**Raleganssiddhi**	839	806	799
2	**Ahmednagar District**	949	885	852

Source: Computed by researcher (Census 1991-2011).

Table No 1.5 shows the child sex ratio of 0-6 age. The table of child sex ratio of model village shows serious problem of very deficient child sex ratio. Child sex ratio of Ahmednagar District declined regularly in the last three decades, it is 949 females /000' male children in 1991 to 852 females /000' male children's in 2011, which is 97 females /000' male children. It is very serious social problem in the study area.

Raleganssiddhi where child sex ratio decreased from 1991 to 2001 by 33 females /000' male children but in the last decade of 2001 to 2011 it declined by 07 females /000' male children.

Rapidly declining child sex ratio of model village is one of the problems of serious concern. In order to overcome this serious problem, schemes such as save girl child, ban on sex determination, sex equality etc. need to be implemented urgently.

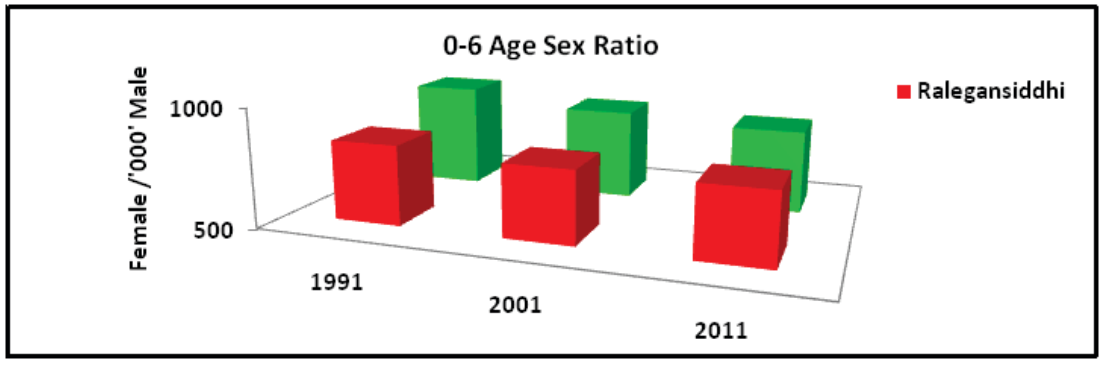

Fig. No 1.5 Population 0-6 Age Sex Ratio of Raleganssiddhi 1991-2001.

Literacy Rate

Table No. 1.6 Literacy rate of model watershed village.

Sr. No.	Name of Village	Population literacy (Percentage)		
		1991	2001	2011
1	**Ralegansiddhi**	62.36	82.19	85.58
2	**Ahmednagar District**	61.03	75.30	79.05

Source: Computed by researcher (Census 1991-2011).

Table no 1.6 shows average literacy rate of model watershed village and the Ahmednagar district. Literacy rate of Ahmednagar district is continuously increased from 1991 (61.03) to 2011 (79.05). The same trend is found in all model watershed village in the study area. In the span of two decade (1991 to 2011) literacy rate Ralegansiddhi 62.36 to 82.19 and 85.58 percentage. However, the above table indicates that the growth rate of literacy that the growth rate of literacy of model watershed village are higher than the Ahmednagar district. In-between 1991 to 2011 show the highest growth rate of literacy Ralegansiddhi 23.22. In the 2011 census shows that the growth rate of literacy on Ralegansiddhi is highest i.e. 2.69 parentage..

Moreover, the table shows greater awareness about literacy in-between 1991 to 2001 than in-between 2001 to 2011 in all model watershed village. The average literacy growth rate in-between 2001 to 2011 is less. In general the literacy rate is increased from 1991 to 2011, but the growth rate of literacy is higher in-between 1991 to 2001 as compared 2001 to 2011.

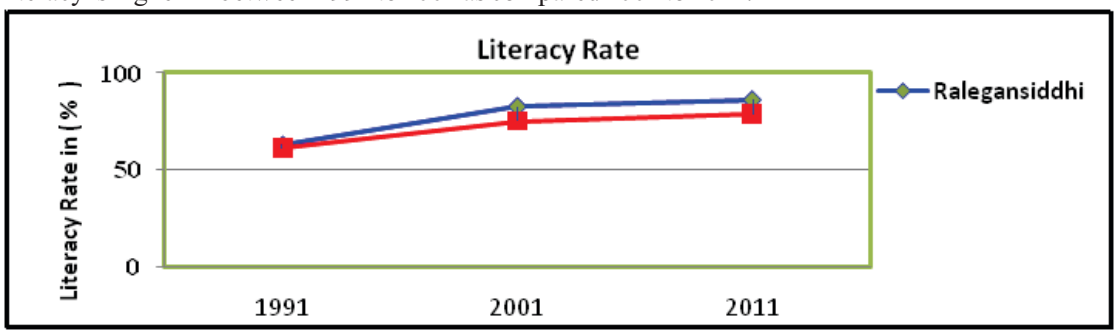

Fig No.2.6 Literacy rate of Ralegansiddhi 1991-2011.

Gender wise Literacy Rate

Table No. 1.7 Gender wise literacy rate of model watershed village (Percentage).

Sr. No.	Name of Village	1991			2001			2011		
		Male	Female	Tot	Male	Fema le	Total	Male	Fema le	Tot.
1	**Rale. Sid**	76.42	47.03	62.36	89.40	73.30	82.19	90.82	80.14	85.58
2	**A. Nagar**	66.50	35.84	61.03	85.70	64.35	75.30	86.82	70.89	79.05

Source: Computed by researcher (Census 1991-2011).

The table no 1.7 shows gender wise literacy rate. From the table it is clear that literacy rate amongst both gender is increasing regularly in Ahmednagar district and village Ralegansiddhi.

However, it observed that the growth rate of male literacy is higher than female literacy. In Ahmednagar district gap between male female literacy rates is declined by 25.17 percent in the last three decades and female literacy rate is almost doubled from 37.35 percent (1991) to 67.48 percent (2011) in the span of three decades.

In model village gap between male female literacy rates was less as compared with district average in 1991 and 2001 census year but this gap decree in villages Ralegansiddhi in 2011 than district average. In these village gap amongst male female literacy is progressive. However there is urgent need to improve female education. This less female literacy rate as compared with male reflect several social problems, such as imbalance in child sex ratio, high proportion of female unemployment, low standard of living etc. Though the growth rate of female literacy shows increasing trend, it is less than the growth rate of male literacy. So the growth rate of female literacy should be increased to avoid socio-economic problems.

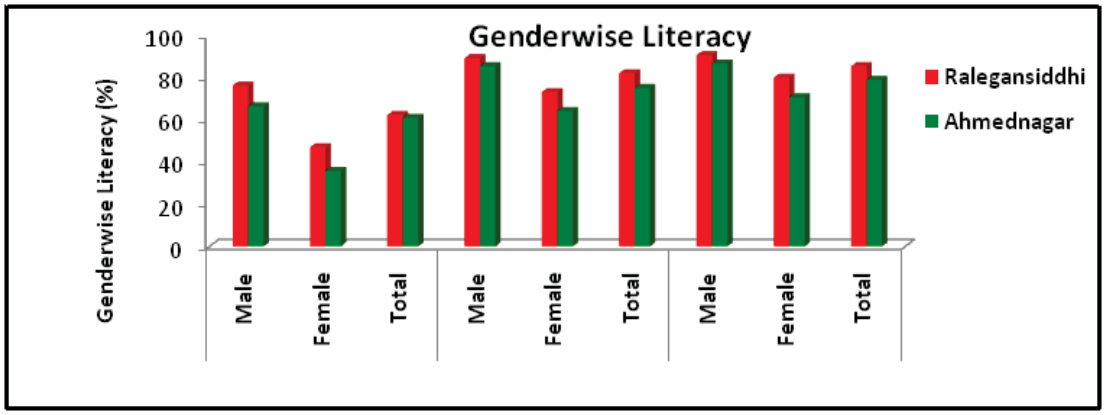

Fig No.2.7 Literacy rate of Ralegansiddhi 1991-2011.

Working and Non- working Population

Table no.1.8 Work participation rate of model watershed village (Percentage).

Sr. No.	Name of Village	1991	1991	2001	2001	2011	2011
		Working Pop^{n}	Non-Working Pop^{n}	Working Pop^{n}	Non-Working Pop^{n}	Working Pop^{n}	Non-Working Pop^{n}
1	**Ralegansiddhi**	41.27	58.73	47.05	52.95	52.67	47.33
2	**Ahmednagar**	45.95	54.05	52.30	47.70	55.29	44.71

Source: Computed by researcher (Census 1991-2011).

Table no 1.8 represents working non-working population in the study area. From the table it is clear that in Ahmednagar district as well as in model watershed village working population continuously increased & non- working population declined as compared to the Ahmednagar district. Average proportion of working population is increased in Ralegansiddhi.

The above table shows that the average proportion of working population is increased in Ralegansiddhi In general it is observed that there is an increasing trend of working population from 41.27% (1991) to 52.67 % (2011) due to watershed development and their allied developmental activities. In general Ralegansiddhi dependency ratio is higher.

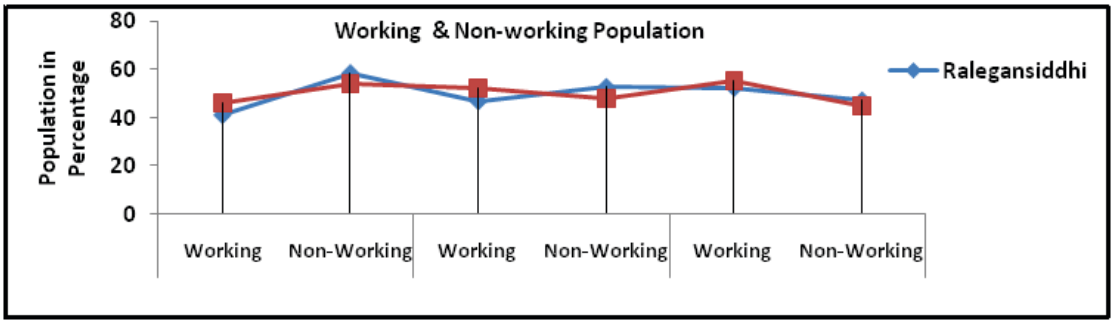

Fig No.1.8 Working and non -working population Raleganssiddhi 1991-2011.

Cast Composition

Table No. 1.9 Caste Structure of population of model watershed villages (Percentage).

Sr. No.	Name of Village	1991			2001			2011		
		S.C.	S.T.	Gen.	S.C.	S.T.	Gen.	S.C.	S.T.	Gen.
1	**Raleganssiddhi**	11.76	2.47	85.77	7.38	1.38	91.24	9.68	2.24	88.08
2	**Ahmednagar**	12.41	7.12	80.47	12.00	7.57	80.43	12.63	8.33	79.04

Source: Computed by researcher (Census 1991-2011).

Table no 1.9 represents cast composition of population. It is clear that population of SC declined from 1991 to 2001 and again increased from 2001 to 2011 in Ahmednagar district. The population of ST increased from 1991 to 2011 in the district. However it is observed that the population of general category is gradually declined from 1991 to 2011.

As compared with Ahmednagar district average of SC and ST population in study area shows considerable variation. Schedule Cast and Schedule Tribe population is decreased. Population of General Category is increased in-between 1991 to 2001 again it is increased in 2001-2011.

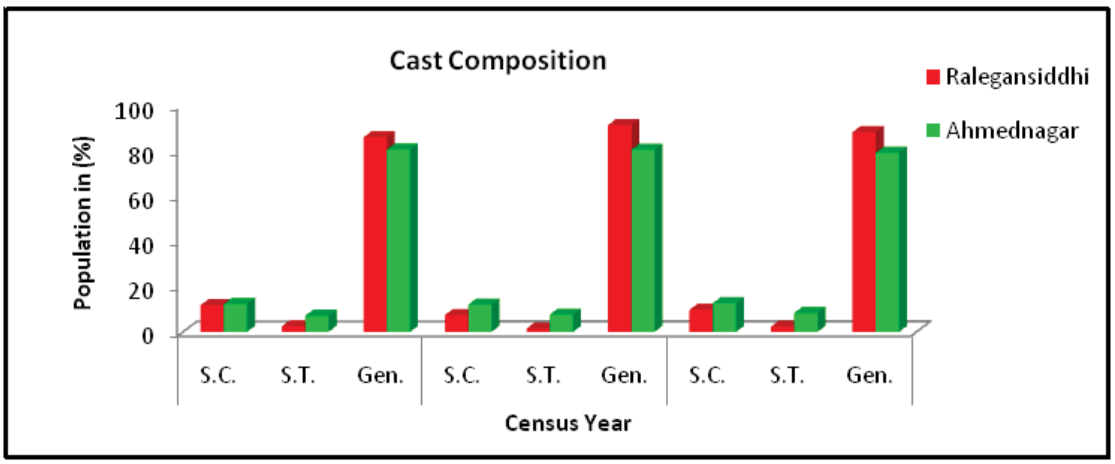

Fig. No1.9 Cast composition of population

FINDINGS AND RECOMMENDATIONS

Major Findings

1. Raleganssiddhi is situated on Decan trap region times Basalt lava flow. 70 percent area of the study region covers by Basaltic hard rock. Due to this type of topography ground water recharge capacity of the region is low.
2. In the Raleganssiddhi percentage of population increased from census 1991(1982) to 2011 (2365). Rate of population increases is less than Ahednagar District.
3. Raleganssiddhi has less population growth rate (2.07 %) as compare with the average population growth rate of Ahmednagar district (12.44 %) in 2011 census. Less population growth rate is indication of impact of watershed Management on human recourse development.
4. Population density Raleganssiddhi has is increasing continuously in all census year. Density of Raleganssiddhi has increased by 39 persons per sq.km. in that last three decades.
5. Declining sex ratio in study area is serious social and demographic problem. It is found that Raleganssiddhi has shows declining sex ratio at the alarming rate. From 1991 to 2001 (92 females/ 000' males) (1026/000'males).In the census year 2001 to 2011 indicates drastic change in sex ratio that is sex ratio incase 133 females/ 000' males. In general the increased sex ratio of the study area is a sigh of socio-economic development of the model watershed village.
6. Raleganssiddhi where child sex ratio decreased from 1991 to 2001 by 33 females /000' male children but in the last decade of 2001 to 2011 it declined by 07 females /000' male children. Continuity declining trend of child sex ratio is serious demographical problem in Raleganssiddhi.
7. Rate of literacy always increased as increased census year due to awareness of education through Gramsabha and socio-economic development of the village. Though the growth rate of female literacy shows increasing trend, it is less than the growth rate of male literacy. So the growth rate of female literacy should be increased to avoid futures socio-economic problems.
8. The average proportion of working population is increased in Raleganssiddhi In general it is observed that there is an increasing trend of working population from 41.27 % (1991) to 52.67% (2011) due to watershed development and their allied developmental activities.

Contribution to the Society

1. Awareness of demographic, social and economical problems is made in study area.
2. Peoples should know sustainable use of natural resources.
3. Socio-economic status of project beneficiaries is increased through this work
4. Environmental awareness and sustainable development of the area is possible by the present work.

Recommendations

1. Social awareness is necessary about several demographic characteristics such as declining sex ratio, increasing dependency ratio etc. which creates several social problem.
2. For the increasing working participation rate among people establishment of agro-base occupations and use of modern techniques in field of agriculture are necessary.
3. Farmer must be trained for additional income generation activities along with agriculture, such as dairy farming, hatchrich and poultry farm, nursery, goat rearing etc.
4. Strong support and technical training from various government departments, such as horticulture, forestry, irrigation, animal husbandry and NGOs is needed.
5. State, Central government and NGOs should work collaborative and give demographic awareness to project beneficiaries of watershed management.

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