RESEARCH FRONT

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WATERSHED MANAGEMENT : A CASE STUDY OF NIGAVE AND BHUYEWADI VILLAGES, TALUKA- KARVEER, DIST. KOLHAPUR

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ABSTRACT

Watershed management is a key issue today. The water crisis has shaken the every walk of life. It is a fate of many areas in spite of receiving heavy rainfall during rainy season. To overcome this problem proper management of water is necessary. The water received during rainy season in a particular area must not be wasted by evaporation and run off. It's run off must be minimized and this water should made to percolate and thus recharge of aquifer can be made possible, which in turn ensure ample availability of water even during summer. For this purpose instead of large area a small unit is useful so that effective water management can be done in that particular area. If this approach is adopted for particular smaller areas which are known as watersheds a considerably larger area can be taken under the purview of water management.

In the present study an attempt is made in this direction to study the watershed management of the villages Nigave and Bhuyewadi from karveer taluca, Kolhapur district.

Key words- watershed, water crisis, runoff, percolation, evaporation, aquifer, recharge

INTRODUCTION

Since last two three decades the land and water resources have been constantly deteriorating. Moreover due to climate changes, the erratic pattern of rains, deforestation and other anthropogenic influences the productivity of soil is continuously decreasing and availability of water and its quality also are badly hampered. Traditional water sources are very much neglected. While the surface bodies of water are heavily polluted and become harmful for life and health. The ground water resources are also polluted and are overexploited and are becoming unproductive. Increasing population and drastic rate of urbanization have been put heavy stress on these limited and already deteriorated resources.

Finding a suitable and long lasting solution to this problem is a need of the day. Only superficial measures are not enough as the problem is persistent. Hence one has to go the grass root level to find the effective solution to this problem. Watershed management is one approach to this problem.

What is watershed?

Watershed - It is a geo hydrological unit of an area draining to a common outlet point. It is recognized as an ideal unit for planning and development of land, water and vegetation resources.

OBJECTIVES OF WATERSHED MANAGEMENT

1. To mitigate the adverse effect of drought on crops and livestock.
2. To control desertification.
3. To encourage restoration of ecological balance.

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4. To promote economic development of village community.
5. To rehabilitate the deteriorating lands.
6. To enhance the ground water recharge.
7. To protect and enhance the water resource originating in the watershed.
8. To reduce occurrence of flood.

To achieve these objectives a holistic approach should be adopted in watershed management. In the present study an attempt is made to focus on watershed management of the villages situated in Karveer Taluca of Kolhapur district. A geomorphological study is made of the area along with its geology and scope for watershed management is studied.

STUDY AREA

The study area is Nigave and Bhuyewadi villages from taluka Karveer district Kolhapur. The area is located on Survey of India Toposheed no 47 L/1 and 47 L/2 having scale 1:50000. The area lies between latitudes 16° 44' 4" N. and 16° 48'10" N. and longitudes 74° 10' 04" E and 74° 14' 15''E. Total area is 26.07 sq.km. The area receives average rainfall about 1200mm. The highest elevation of the Nigave Nala is about 960 m. while lowest elevation is about 534m. While that of the Bhuyewadi Nala is highest 789m., lowest- 533m. Sugarcane is the main cash crop in the area covering about 70% of the cultivated land. Other crops include soya bean, maize, rice and various vegetables. The area is drained by 2 nallas Nigave Nala and Bhuyewadi Nala.(fig no 1)

GEOLOGY OF THE AREA

The area is overlain by basaltic rocks which are known as Deccan Trap in Indian geology. Deccan Trap is divided into three subgroups which consist of twelve formations. (Hooper et.al.1988). Rocks from Wai Subgroup Panhala formation are exposed. (Table no 1) The age of the basalt ranges from Upper Cretaceous to Lower Eocene.

Classificatilon of Deccan Basalts (K. V. Subbarao and Hooper 1988)

GROUP	SUBGROUP	FORMATION
DECCAN BASALT	WAI	DESUR **PANHALA** MAHABALESHWAR AMBENALI POLADPUR
	LONAWALA	BHUSHE KHANDALA BHIMASHANKAR THAKURWADI UPPER MIDDLE LOWER
	KALASUBAI	NERAL IGATPURI JAWHAR

Table No.1

METHODOLOGY

The geomorphological study of the area is carried out. Field visits and field survey method are also adopted for study purpose. GIS based drainage map of the area is also developed for study. (fig no2). With the help of DEM data from NRSC Bhuvan is obtained.

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The DEM are downloaded by USGS SRTM Arc 30m. resolution. Digital elevation model (fig no 3) provides the data about elevations of the topography and provides topographical details.

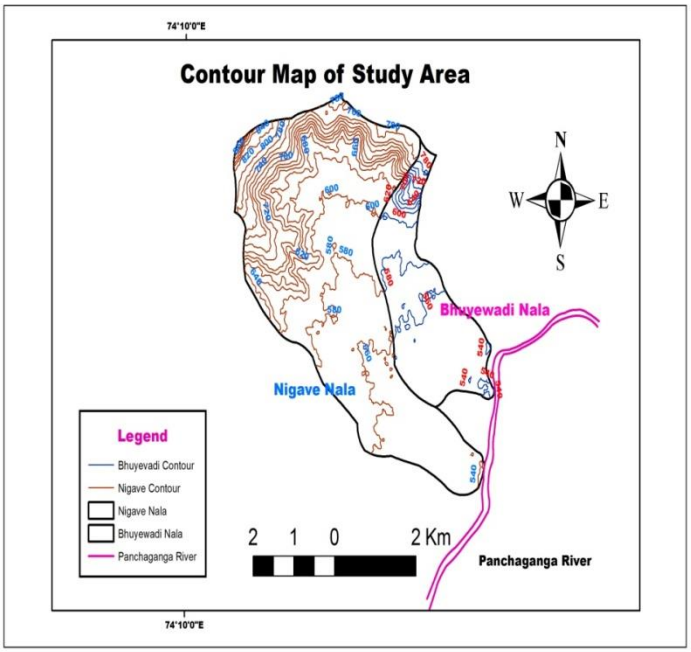


Fig. 1

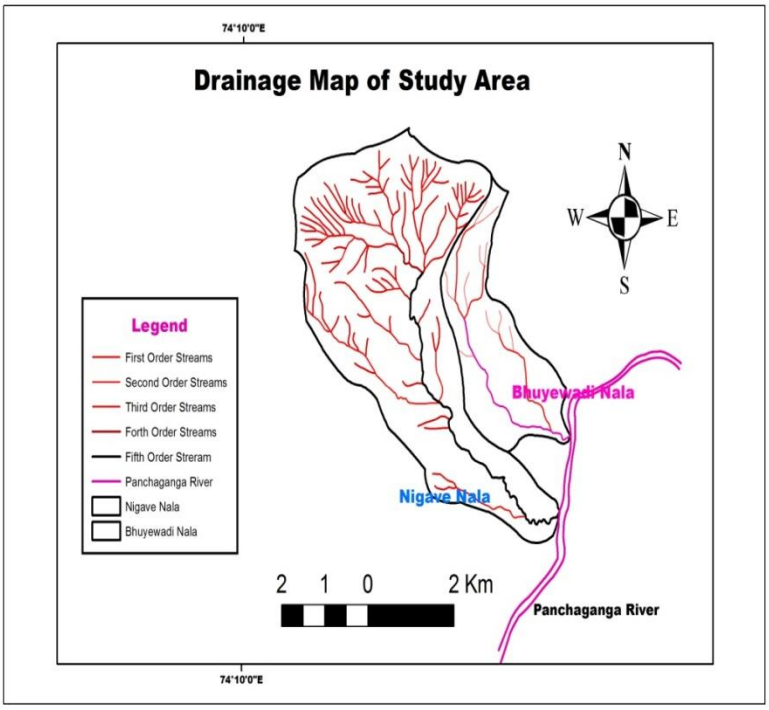
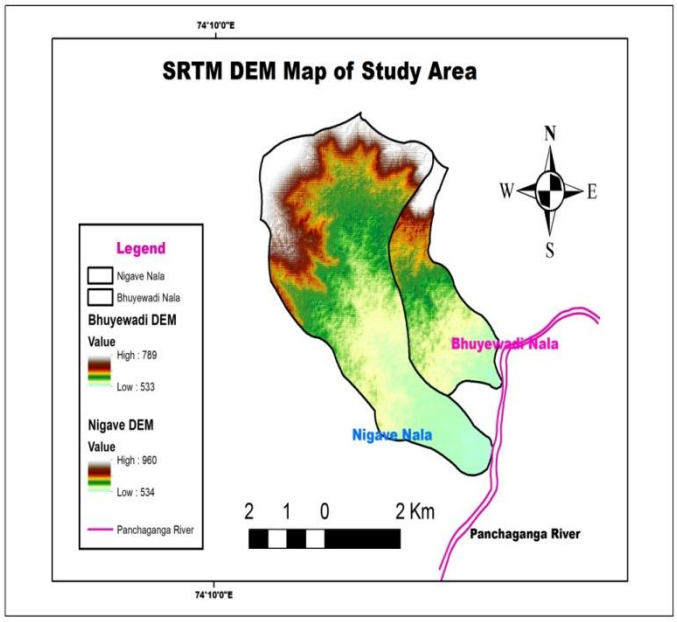
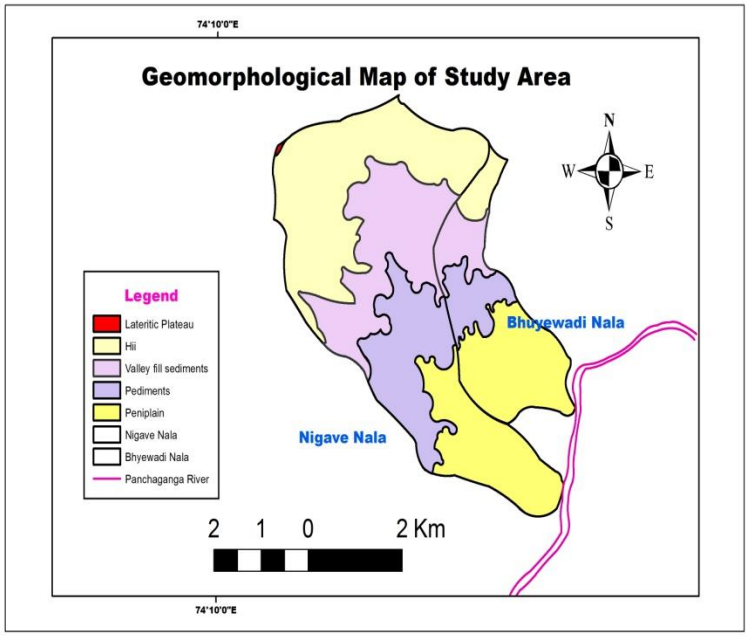


Fig. 2

ISSN
(Print) 2320 – 6446, (Online) 2320 – 8341



(Fig no 3)



(Fig.4)

Geomorphological units of the area- from geomorphological map (fig.4) of the area it is evident that the study area has following geomorphological units.

1. **Hill**- In the upper region the slope is steep which becomes gentle at the bottom. The runoff is moderate. It is shallow and well drained. Drainage pattern is dendritic. The groundwater prospect is poor.
2. **Valley fil**l- It. the groundwater potential is moderate to good.
3. **Pediments**- It is a transition zone between hill and adjoining plains. These are shaped by erosion and transportation. In study area pediments are developed over basaltic

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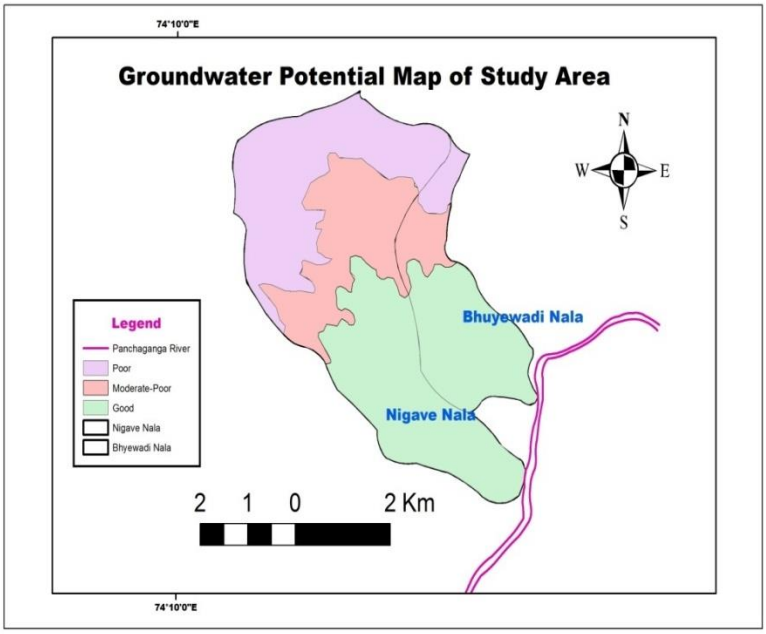
terrain. The slope is moderate. Drainage pattern is dendritic. Ground water potential is good.

4. **Peniplain**- These are relatively flat rock surfaces. They are gently undulating and plain. Drainage pattern is dendritic. Ground water potential is good.



(Fig no 5)

The ground water potential map shows 3 potential grades viz.-

Poor, moderate-poor and good. The poor potential zone covers the area of about 25%. Hilly area comes under this category. (Fig no 5) It shown with violet colour. The moderate to poor potential zone covers an area of about 25%. Valley fill deposits come under this zone. The features like pediments and Peniplain occupy almost 50% of the area and they demarcate good potential zone for groundwater. It is shown by pale green colour.

CONCLUSION

From the above study it is seen that the study area has fairly good potential for groundwater. From field visits it is clear that the dug wells and bore wells in the area have good productivity. However during summer the area experiences paucity of water especially from point of view of irrigation. The sufficient water may not be available for crops especially for sugarcane which is a major crop of the area. This underlies the need of minimizing runoff and to increase the rate of infiltration. The upper part of the area is hilly and the runoff rate is very high resulting in poor infiltration. By methods like nallas bunding, trenching and by plantation of trees which has capacity to hold water this runoff can be minimized. In the moderate potential zone also there is a scope for increased infiltration by applying some measures like rain water harvesting, artificial recharge, bore blast technique etc.

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Application of these methods can result in rise in percolation of water thus increasing recharge of aquifers which in turn ensure the ample supply of water during summer or during famine also.

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