



Review Of Research



MORPHOLOGICAL CHARACTERISTICS OF SONVI-GADGADI RIVER SYSTEM, RATNAGIRI (MAHARASHTRA) KEY WORDS – STREAM NETWORK, FLUVIAL SEDIMENT, LATERITE

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ABSTRACT

Rivers are a fundamental feature of landscape. River water is used for domestic, industrial and agricultural purpose. Rivers are central to many environmental problems. The rivers are studied by hydrologists, engineers and ecologists as well as geomorphologists. 'An awareness of the interdisciplinary nature of many contemporary problems and of the mutual concerns of these related disciplines will provide an improved appreciation of the need for the study of river '(Rivers – Geoffrey E. Pets pp 11).

KEYWORD: Sonvi-Gadgadi River, landscape, River water

INTRODUCTION

Therefore study of river system is significant contribution in understanding th processes. 'Fluvial Geomorphology is a branch of Geomorphology which deals with origin and formational processes of rivers in the widest sense' (River Morphology, J. Mangelsdorf). 'It is concerned with the processes of water and sediment movement in channels and with the channel forms produced by these processes.' (Rivers- Geoffrey E. Petts, pp 23). 'It is also a descriptive science obtaining its insights mainly from the careful observation of natural phenomena. This discipline also employees the research results of a related sciences such as physics, hydraulic engineering, geology, hydrology, climatology and landscape ecology (River Morphology, J. Mangelsdorf). In Maharashtra, Laterites occur in three different geomorphic settings,

- 1) In Western Ghats
- 2) In the Konkan region
- 3) In the Eastern Part, in Chandrapur and Bhandara Districts.

The study of Laterites was done by Geologists as Dr.Sahasrabudhe, Y. S. and Nag (1956), Dr.Suryanarayana, G. (1967), Dr.Deshmukh, S. S.(1975, 1977), Dr.Pawade, M. B.



And Dr. Sudeshkumar (1976, 1979). (Lateritisation, The Laterites of the Maharashtra State – By Y. S. Sahasrabudhe and S. S. Deshmukh). The research work of Dr.ShrikantKarlekar, Prof. Dr. V. S. Kale, Prof. U. D. Lulkarni, Prof. K. B. Powar is a guideline to the researchers. The majority of these works are mainly focused on Konkan Coast. The Laterites of his region are studied by Dr Karlekar, Sahasrabuddhe, Dr.Rajguru and Dr. Dixit. The study of the fluvial system in laterites of this region are less in number. Dr. Dixit has published a morphometric account of rivers of Konkan. Proposed work is an attempt to study the Sonvi- Gadgadi Rivers flowing through two geologically varied areas that is basaltic and lateritic. The research work involves study of morphology and morphometry of the Sonvi- Gadgadi River, characteristics of this drainage system, form and processes, channel cross section of the channel.

This study will improve the understanding of the relationships between different

components of the river system. This study will also help in better understanding of man-river relationship. The utility of this study shall extend in water management, environmental management and flood mitigation.

MAJOR OBJECTIVES OF THE PRESENT STUDY –

1. To study the Geomorphology of Sonvi and Gadgadi River basin.
2. To study the morphometry of Sonvi and Gadgadi River system.
3. To assess the geometry of Sonvi and Gadgadi River channel
4. To identify and analyze land forms formed by river Sonvi and Gadgadi River.
5. To study the sedimentation in the channel of Sonvi – Gadgadi.
6. To analyse the effects of lithology, rock structure and rainfall on the drainage network.

STUDY AREA :

Location :

The district Ratnagiri lies between 16 30 North and 18 00 North latitude and 73 00 East to 74 00 East longitude on the Konkan strip along the West Coast of India. Ratnagiri district is typical Konkan, a monsoonal land with great contrast in nature, of heights and plains, of wet and dry seasons, of forested and cultivated stretches, of bare lateritic plateau surfaces and intensely tilled valley. Laterites of Maharashtra occur in different geologic- geomorphic environments. (The Gazetteers Department – Ratnagiri)

Geological Divisions :

Ratnagiri District may be divided into five longitudinal belts : the sea coast, an inland belt of laterite, 8 to 10 miles broad, another belt of 10 miles breadth of mixed basalt and laterite, a belt of basalt 6 to 8 miles wide and the Sahyadris. (Maharashtra : A regional Study , pp 173) The mode of formation of laterite is a matter of controversy. The laterite plateau is bare with no vegetation, at an average elevation of 400 to 600 feet. It supports scanty scrub and stunted scattered trees. It is cut through by numerous rivers, the largest of which rise near the Sahyadris, and after flowing across a comparatively open trap belt, enter the laterite by deep ravines, which widen towards the sea to become broad tidal creeks. (Maharashtra : A regional Study, pp168)

Climate:

The climate in Ratnagiri district or study area is humid. The study area receives heavy rainfall leading to higher run-off. Rainfall is reliable and heavy from 100 inches to 120 inches from the months, June to October. It leads to higher run-off. The rainfall increases from the coast inland, till one reaches the Ghats. (Maharashtra : A regional Study – Edited by JaymalaDeedee, pp171) The district receives rain from the SouthWest monsoon during June to October.

Rivers :

All the major rivers in this district originate from the Sahyadri ranges and flow from east to west to drain into the Arabian Sea. Most of the rivers are non-perennial. Only during monsoon they flow at bank-ful and over-bank stage.

Physical Set up of Study Area :

The Sonvi – Gadgadi River is a tributary of the Shastri River. The Sonvi-Gadgadi River lies in Sangmeshwar Tehsil of Ratnagiri District in the States of Maharashtra. The Sonvi River rises at Tikleshwar Mountain hill, at an elevation of 236.22 meters above mean sea level.

The Sonvi River rises to the east of OzreKhurd village in Sangmeshwar Tehsil and flows in northward direction and again turns in north-western direction and joins the Shastri River at Navdi, Near Sangmeshwar town.

The Sonvi – Gadgadi river basin extends between 73 31 E Longitudes and 17 06 N to 17 11 N Latitudes. To the east is Sahyadri escarpment, while to the west there is occupied by Arabian Sea. These are

seasonal rivers. There is water in pools and flow in form of streak in summer. The lower course of river gets flooded during the monsoon. It is because of the tidal influx of water up to Sangmeshwar.

Sonvi river basin exhibits a dendritic pattern of drainage. Sonvi River receives many tributaries from north east direction along its course. Some of them are River Dhosali, River Kharkati, River Gadgadi, River Gadam, RiverGosavi etc.

One of the most notable features about the river is that all its important tributaries (mainly 3rd and 4th order streams) flow are right bank tributaries. River Gadgadi is the longest important tributary to the Sonvi. The Gadgadriver rises in the Sahyadri ranges near Kundi Pass at an altitudinal of mts. Its eastern margin runs along the crest line of the Western Ghats. The western part is characterised by a series of lateritic tablelands and detached hills (Dr.ShrikantKarlekar, Inst. Indian Geographer, Vol.9,No. 1, Jan.,1987).

River Gadgadi initially flows from east to west with a straight channel near its source. Then Gadgadi River takes sharp turn to north passing through Phansawale, Devole and Kinjale Villages. All the of tributaries are parallel to each other. The rectangular pattern and straight channel with sharp turns are suggestive of structural control over the channel form. From Kinjale village, Gadgadi River flows to South-west. The confluence of Sonvi and Gadgadriver is at Sonawade village.

A dam is constructed on Gadgadi River at village Kule-Vashi, ---- km from its source. The length of this dam is 414 meters and the height of the dam is 35.20 meters. River Gadgadi is the fourth order stream. The velocity of Gadgadi River is high because of the slope of the region. Hence the name is given. In the source region of Sonvi River and before the confluence of Sonvi – Gadgadi river in Sonawade village, the velocity is very high due to the slope of the region, the water discharge is high in monsoon. It leads to the transportation of the large boulders. Such large boulders are observed in river channel at village Vashi. Compared to Gadgadriver the velocity of Sonvi is less. The Gadgadriver forms meanders before the confluence with Sonvi river near Borsut and Sonawade village.

The bifurcation ratio of the basin is 5.1833. The average bifurcation ratio for the Sonvi – Gadgadi Rivers together is 5.1252, a value characteristic of mature basin and also indicates that geological structures have not distorted the drainage pattern. The Length ratio of the basin is 2.59.

Bed channel characteristics :

'Bedrock channels are defined as channel segment with lack of coherent bed of active alluvium. In addition to consolidated rocks, "bedrock" in this contest can also include cohesive fluvial deposits now undergoing dissection. Bedrock section is common along many river in mountainous regions often occurring waterfalls, but most commonly forming the headwater tributaries in channel networks' (Richard , 1987).

Sonvi – Gadgadi Rivers rise in the mountainous region of the Western Ghats, therefore the bed rock channel is developed in this source region over the length of km. The bed rock is the basalt. The Sonvi river has the bed rock channel upto the confluence of Sonvi and Gadgadi. After the confluence there are landforms of deposition like bars, terraces etc.

There are number of pools, point bars and mid point bars in the channels or along the bank of the channel. After the confluence of Sonvi and Gadgadriver, there is a very long point bar with pebbles and gravels. Rapids are found in Sonvi River near Sonawade village. Bank cutting is seen. In monsoon river flows at bank-full or over-bank stage. The river terraces are wide at Lovale and Mhabale. After Burambi, the river flows through lateritic region. The silt, clay type of alluvial deposition is seen along the convex bank, cuttings are seen along the concave bank. The numbers of mid bars increases due to the deposition of the silt and clay. There are big trees and grass on the mid bars. It indicates that they are stable.

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