

# International Multidisciplinary Research Journal

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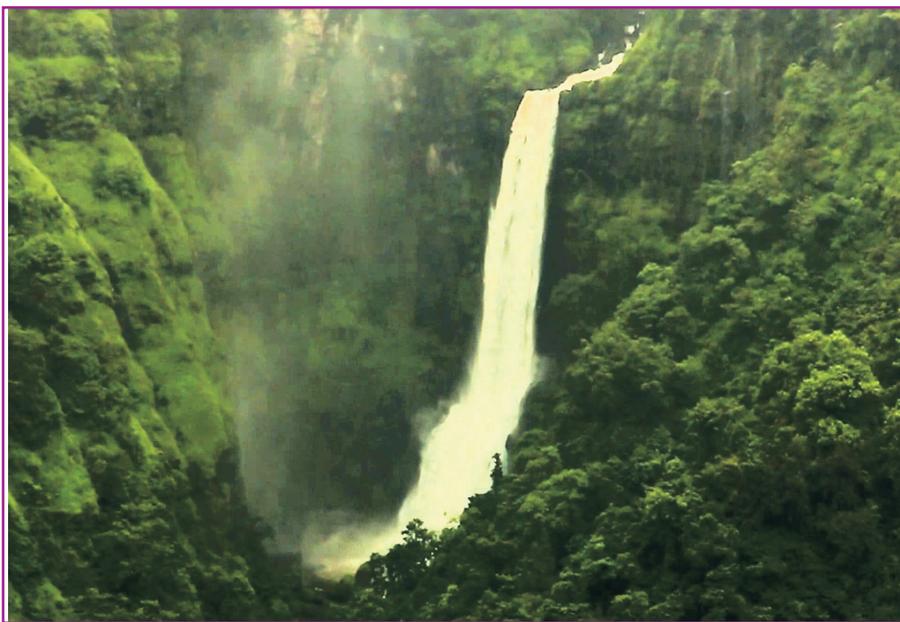


## THE STUDY OF DOWN STREAM CHANGES IN FORM OF RAM ODHA CHANNEL IN BHOR TAHSIL OF PUNE DISTRICT

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*important character of the streams of this region is highly variable discharge and the periodic occurrence of high flows.*

**KEYWORDS:** Down Stream, Ram Odha, Cross section.

### INTRODUCTION

The shape of the channel is determined by its width and depth. It is therefore often measured by the ratio of water surface width to mean depth the ratio is known as the form ratio (Scumm 1977). Natural channels reveal a wide range of channel forms. The domination of channel in cross-section and in plan is defined as channel morphology. At a station channel cross section is controlled by the independent variables of discharge and sediment load, but at the reach level, the channel morphology is the result of the channel configuration at the reach and immediately upstream, Sediment load entering the reach and the composition of the bed and bank material. The resultant channel form is

### ABSTRACT

**N**atural rivers reveal a wide range of channel forms. The dimensions of a river channel in cross-section and in plan are defined as channel morphology (Petts and Foster, 1985). The channel form or morphology plays an important role in determining the geomorphic effectiveness of any flow and hence in the present study an attempt has been made to evaluate the channel geometry of a seasonal Ram Odha stream in the Bor Tahsil of Pune District. The form or shape of the channel determines the area of fraction between the flowing water and the channel bed bank represent

*by perimeter shape represent the configuration or form of the channel in cross-section. The type and density of vegetation cover also influence of the channel shape river increase your width and depth ratio.*

*All the cross-sections are taken at near Bor in Ram Odha channel in Bor tahsil. The Ram Odha is a rain fed fourth order stream with a fluvial regime closely following the monsoon. It records high discharge in association with high rainfall events occurring in the months of June to September. But with the withdrawal of the monsoon the discharge rapidly falls and low flows are recorded in the post monsoon season. Another*

an expression of the balance between stream power and the resistance offered by the channel perimeter (Morissava 1969). Although a number of morphological variables have been used to describe the channel form, the most frequently used variables are the channel width, depth.

### OBJECTIVE

- 1.To study the downstream changes of the Ram Odha Channel
- 2.To understand channel characteristics of the study region

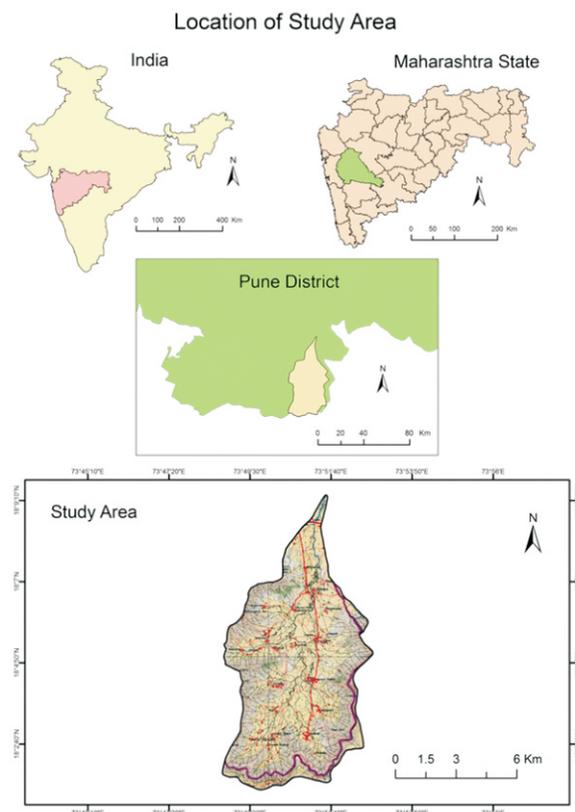
### METHODOLOGY

The present study work is related with the channel form characteristics of Ram Odha, various geomorphic parameters have been taken into consideration. In order to undertake the present study a plan of field work has been prepared, which involved selecting sites for channel cross sections, and surveying the channel cross sections by using a Dumpy Level. The measurement reading of channel cross section is taken with the help of Dumpy Level Survey. The base map of the study area has been prepared by using SOI Toposheet No. 47/F/16 on the 1:50000 scale. This includes the preparation of drainage map.

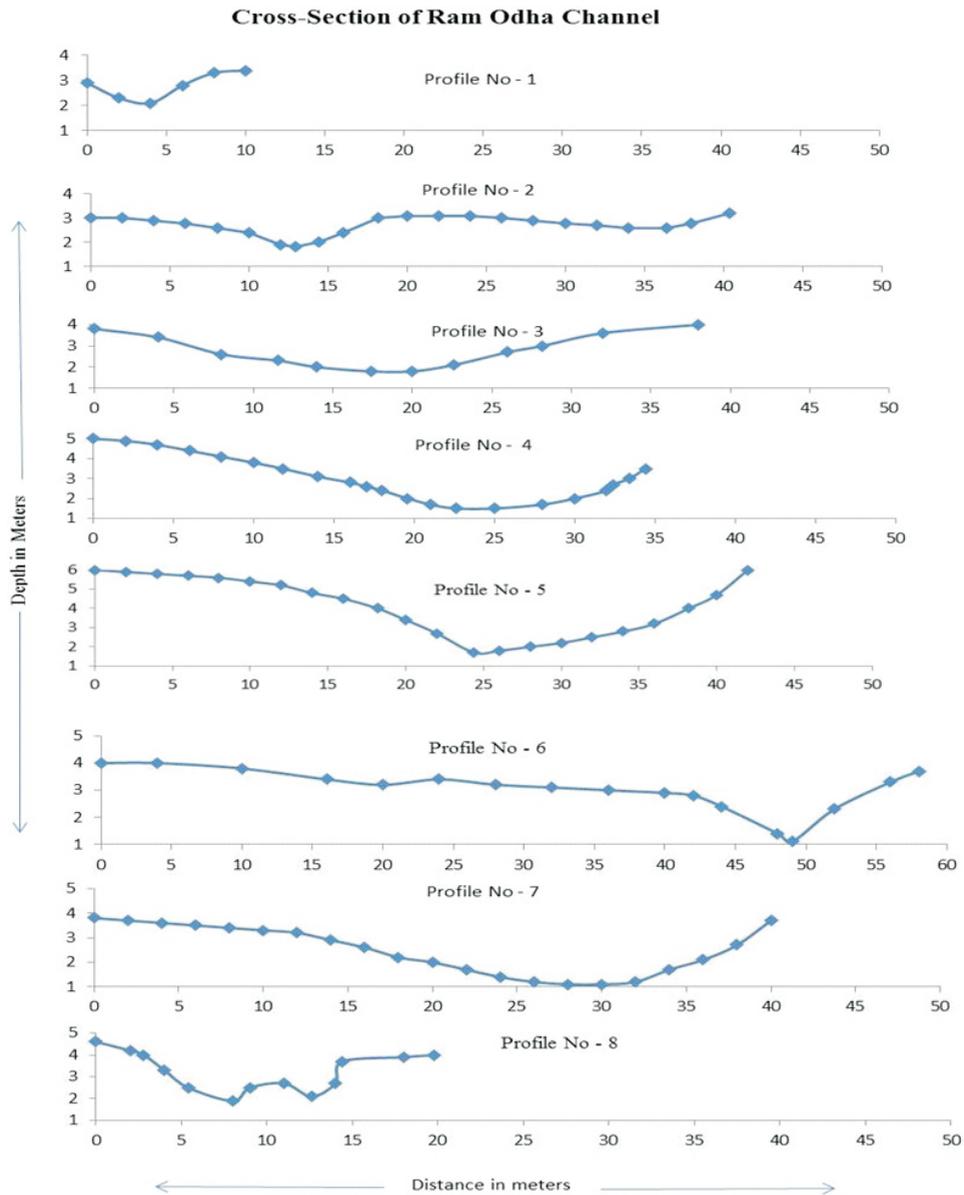
### The Study Area

The drainage basin selected for the present study is situated along the eastern offshoot of Sahyadri mountain range. It extends from  $18^{\circ} 2' N.$  to  $18^{\circ} 9' N.$  Latitude and  $73^{\circ} 48' E.$  to  $73^{\circ} 53' E.$  Longitude. The catchment area of Ram Odha extends in the south-north direction. It is situated in Bhore tahsil in Pune district. The stream rises near Vardoi Budruk at about 1300 m and flows in the northerly direction and meets to the river Nira near Bhore at an altitude of 600 m.

### Location Map



**Cross-Section Profile of Ram Odha Channel**



**CHANNEL CROSS SECTIONAL CHARACTERISTICS**

Profile No.	Downstream Distance Km	Width (M)	Depth (M)	W/D Ratio	Bed & Bank material
1	1.400	8.6	0.9	9.55	Right bank manmade feature & left bank farm, in channel pebble.
2	2.750	40.6	2.8	14.5	Bed rock, Gorge
3	5.300	36.6	2.2	16.63	Left bank deposition & pool
4	6.200	35.6	1.5	23.73	Smooth meandering, left bank erosion. Right bank vegetation.
5	7.050	42	3.8	11.05	Right bank mud deposition, left bank vegetation.
6	11.050	57	2.9	19.66	Right bank vegetation, left bank boulder.
7	11.300	40	2.4	16.67	Pebbles & boulders.
8	12.650	19.8	2.1	9.43	Left bank vegetation, Right bank pebbles.

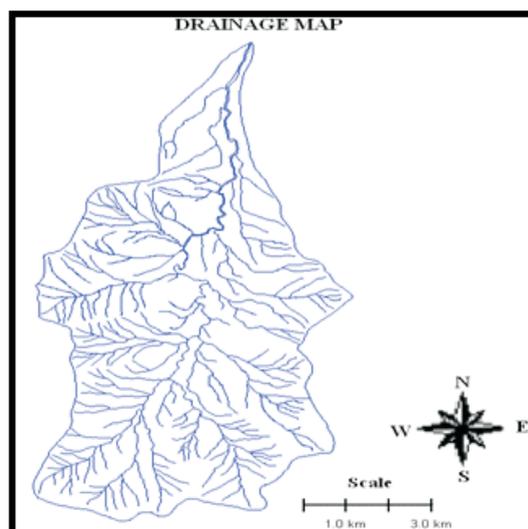
(Computed By Researcher)

### CHANNEL CROSS SECTION

Channel cross section or channel width depth ratio is a result of velocity slope, surface rock type, vegetation and discharge. At the source region channel is narrow. As we go downstream width increases but in some station width decreases due to increase human interferences and artificial bund created by people along the channel. In this study region in some settlement locations are very close to Ram Odha channel.

### The Drainage Characteristics

The Ram Odha drainage basin shows a dendritic type of drainage pattern. The drainage network pattern is dendritic type because it shows a tree like branching of streams in all directions. This is the most common drainage arrangement in the Upland region.



### CHANNEL FORM

The nature of changes in the channel form in the downstream direction was mainly determined by the rate of change in discharge with catchments area. In the field, the channel has been defined by taking into consideration the first break in the cross profile and also based on the maximum level of flood waters. In the present study 8 channel cross section sites were selected and channel cross sections were surveyed and plotted for these sites.

### CHANNEL WIDTH

The channel width has been measured in the field and the maximum width has been considered for the present study. The channel width is it varies between 8.6 m and 57m. In general the channels are narrow in the upstream sections at Vardoi Budrukh near source region profile no. 1 it is 8.6m. The maximum channel width is observed at Hatnoshi, profile no. 6 where it is 57m.

### WIDTH/DEPTH RATIO

The width/depth Ratio or the form ratio is a good indicator of the efficiency of the channel to transport sediments. The maximum width/depth ratio is observed near Palsoshi (Profile no. 6). It is 23.73 m while the minimum width/depth ratio is 9.43 m near Bhor city in the lower region. The average width/depth ratio or Form ratio is 15.15 m of the Ram Odha channel.

### CONCLUSION

All the cross section taken near Bhor and 20 Km away from Bhor downstream in the monsoon season, release the water to Nira River near Bhor City. The channel forms are developed in response to a number of dependent and independent parameters. Based on the surveys carried out during January a number of

observations were made. In the study area, the channels show some distinctive features channels are composed of varied materials some are pure bedrock channels while others are composed of partially bed rock and partially unconsolidated materials some channels are found in unconsolidated material with gravel beds. Some are gravel bedded with man-made built-up banks near Bhore City. Banks are built of cement and boulders, few channels are composed of unconsolidated material.

- 1) In general channel is narrow in upper part of the Ram Odha basin but narrow in some region near the channel like Bhore City due to increases more urbanization and its impact directly on the channel but broad near the confluence with Nira River
- 2) Channel depth increases in the downstream region but some region depth are low due to bedrock.
- 3) The Ram Odha channel bed is rocky, covered basalt rock. Erosion features are forms such as pothole, gully, gorge etc.
- 4) In the Ram Odha channel near Profile No. 5 there is deposited gravel, boulder and sand
- 5) The Ram Odha channel is elongated shape of the basin, in this channel flood is high during monsoon season.

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