

**PALAEOCHANNEL MAPPING OF MORNA WATERSHED,  
AKOLA DISTRICT, MAHARASHTRA, INDIA**



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**I. INTRODUCTION :**

Our aim is to study the palaeochannels mapping of morna watershed. The Morna watershed rises in the Washim tahsil near Shirpur village and flows through an open and flat country of the plateau, before passing through the large village of Medsi on the edges of the plateau. From here, the river goes through the Ghats in a romantically picturesque country with sharp bends in between interlockingspurs developing a deep valley with a cliff face on the outer bank and wide alluvial flats on the inner bank before entering into the Payanghat plains. In this section, the Purna - Akola - Khandwa railway line closely follows the river and sticks to the narrow ledge

**ABSTRACT**

*The field of geography is primarily concerned with theA remnant of an inactive river or stream channel that has been either filled or buried by younger sediment. The sediments that the ancient channel is either cut into or buried by can be unconsolidated, semi-consolidated, consolidated, or lithified.The word palaeochannels is formed from the words "palaeo" or 'old', and channel; i.e.; a palaeochannels is an old channel. This may be synonymous with palaeovalley and palaeoriver.*

*Examples:-Morna and Purna River, Maharashtra, India etc.*

*The satellite data used in the study is acquired from the various satellites and sensors and was used in the form of geo-coded false colour composite. Formorna watershed, LISS- III data 2008 covered by Path- 102 and Row- 55, 102 and 49, 102 and 50 was procured in the form of digital data. The feature are distinguished using the interpretation keys tone, texture, size, shape, and association are used to interpret land use pattern. The database is created using various techniques for the morna watershed. The drainage map is digitized from LISS-3 Image using Arc info software. The land use /land map created using Digitization method in ARC INFO software. Other thematic layer like Drainage, River, built-up land are also generated using ARC INFO software. Digitization technique used to digitize drainage, and water body, using ESRI's software like ArcGIS Desktop 9.3 and Arc Info Workstation 7.2 software used for the removing the error from the digitization process such as overshoot, and undershoot.*

*Arc GIS Desktop 9.3, Arc Info Workstation 7.2.Arc GIS and Arc info are the sophisticated software which is useful in drawing maps. It is found in two versions one is9.0.1 and other is 9.0.2. This software supports the new operating system versions. Starting*

adjoining the valley-side and crosses the river at no less than four different places to gain a foothold from one side of the deep valley to the other. Descending down from the scarp, the river flows through a fairly gently sloping country with a perennial channel on its bed. It skirts past the town of Akola just after it is joined on its right bank by the tributary, Indrupa. In its lower course, the river has developed extensive meanders and cut off loops, unlike many other left bank tributaries of the Purna. It develops a sub-parallel course for nearly 20 km before joining the main river near the village Andura. The length of the river is 113 km.For this purpose Survey of India

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Toposheet no.55D /13 and 55D/14 was selected.The Toposheet comprises parts of Akola District. Akola area is one of the eleven districts of Vidarbha region of Maharashtra. It is situated in the northern part of the State abutting Madhya Pradesh and lies between north latitudes 20°16' and 21°17' and east longitudes 76°38' and 77°38'. The total area of the district is 5417 sq.km and falls in parts of Survey of India degree sheets 55 D. The district is bounded on the north by Madhya Pradesh State, on the east by Amravati, on the west by Buldhana

with arc tools is very simple.We can use the ARC, ARCDIT, ARCPLOT, or GRID prompts to get started. Syntax for this is as follows:

Arc Tools is a general purpose, menu-based interface to ARC/INFO designed to get new users started quickly and to make all users more productive at performing common geoprocessing tasks. Common operations such as mapping, query, data automation, and analysis are implemented through a series of AML-based tools and menus.Arc Tools are functionally grouped into four tool sets: Map Tools, Edit Tools, Grid Tools, and Command Tools. This allows related tasks to be processed logically and quickly.The Edit Tools menu bar has six main pull down menus: Arc Tools, File, Edit, Tools, Display and the Help button. The pull down menus access tools that can be used collectively or independently to create and edit coverage/layer features and descriptive data, perform feature-oriented editing, display coverage/layers, establish environments to control editing and snapping, and manipulate and analyse data. The Arc edit canvas is used for graphic display.

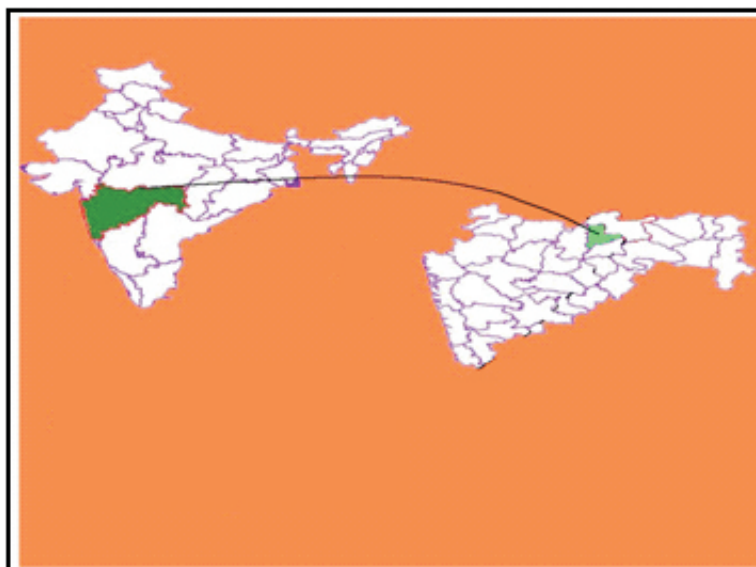
**KEYWORDS:** Palaeochannels , Formorna watershed , palaeovalley and palaeoriver.

#### SHORT PROFILE

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district and on the south and south east by Washim district.

Location maps as follows



Study of area:-

### Akola District Maharashtra Map



The climate of this area is characterized by a hot summer and general dryness throughout the year except during the south-west monsoon season. Temperature rises rapidly after February till May which is the hottest month of the year. In May, the mean daily maximum temperature at Akola is 42.4° C. (108.3° F) and the mean daily minimum temperature is 27.5° C (81.5° F). During the period from April to June, on individual days, the day temperature rises up to about 46° or 47° C (114.8 or 116.6° F). The normal annual rainfall over the district varies from about 740 mm to 860 mm.

The type of vegetation is mainly governed by the soil formation, configuration of the ground drainage and the influence of man. The variations of rainfall are very little in the district, average rainfall being about 30" to 40" received from the south-western monsoon. The forests in the district fall in the "South Indian Tropical dry deciduous" type. The chief species of the forests is teak. It is found all over except the forests thicketed with babul trees and grass remains. The type of vegetation is mainly governed by the soil formation, configuration of the ground drainage

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1. Palaeochannels mapping of Morna watershed by using remote sensing techniques.
2. Find fresh water ponds in palaeochannels of Morna.

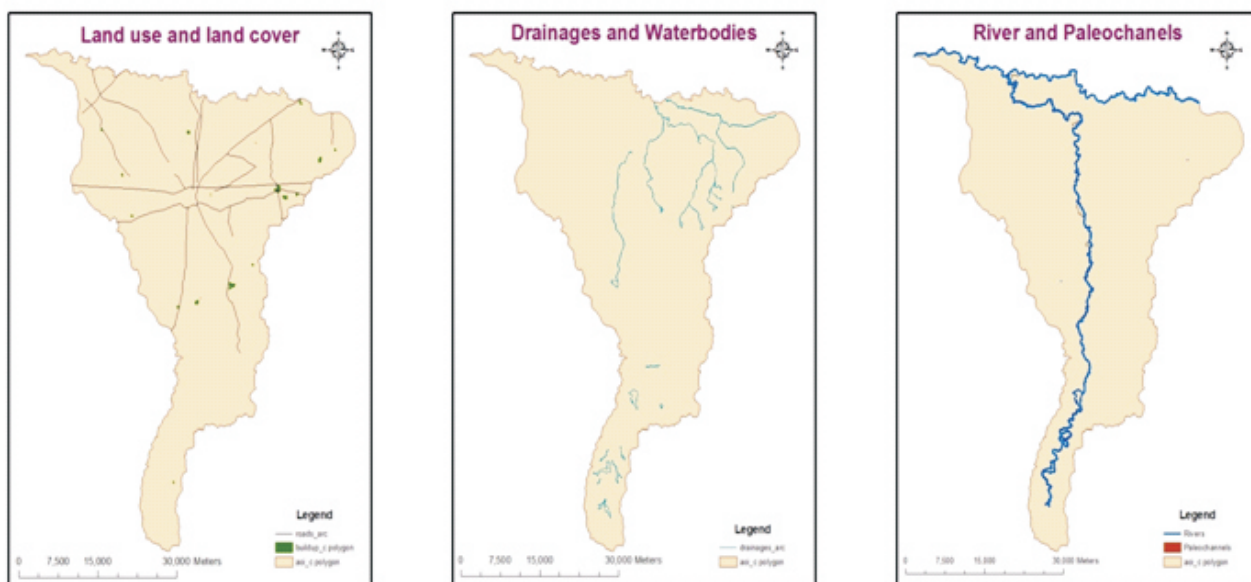
## II. METHODOLOGY

Geomorphological Mapping has assumed a great significance with the availability of space images. It has not only helped in identification of landforms but has also contributed significantly in understanding the distribution of the landforms and study of inter relationship between different landforms thereby improving the geomorphological mapping on different Scales. Remote sensing has contributed significantly in the spatial and

temporal analysis of landforms, which has lead to better understaning of geomorphic processes in the formation of landforms and its spatial variations. And this has been main reason for improvement in the geomorphological mapping. The satellite based Geomorphology mapping broadly involves onscree interpretation using image interpretation keys. The satellite imagery

has been displayed onto a computer screen and image interpretation has been carried out based on image interpretation elements and ancillary data, as per the classification scheme. Remote sensing technique is the best technique in understanding the various landforms in region.

Digitization Maps are as follows:



**III. Geology of the Study Area:-**

III.1 Akola area is bounded on the north by the southern foot-hill of the Gavilgarh range which, in turn forms a part of the Satpura range of hills whereas, on south, it is bounded by the Ajanta and Satmala hills. Another range comprising of steep hills runs across the middle of

the southern tahsil but for the above abruptly rising hills, the entire district is more or less a fertile alluvial tract drained by the Purna, Katepurna, Adan and Penganga rivers. The entire district is occupied by Deccan basalt flows with intertrappean beds at places, river alluvia and soils.

**III.2 Stratigraphy of the Study Area Table III.2**

Formation	Age
Soil, river alluvia, calcareous Kankar and sands, etc.	Recent
Conglomerates	Sub-recent
Trap dykes	Cretaceous
Deccan basalt flows with inter-trappean Beds, ash beds.	Eocene
Erosional Unconformity	~~~~~
Upper Gondwana sandstones	Lower cretaceous

### III.2.1 UpperGondwanasandstones:-

The outcrops of the upper Gondwana have been reported by L. N. Vaidyanath (1961) about 0.3km towards NE. They comprise soft sandstones having a strike in N 80° E-S800 W direction and dip of about 30° towards N 10° W. One more outcrop of this rock appears near the dam site of the Man river project, about 1.6 km south-east of Wari.

### III.2.2 Deccan Traps:-

The trap covers a major part of the district and is characterized by basalt lava flows which are generally dark grey, hard and compact. The tops of individual flows are usually vesicular and zeolitic while the middle zone is fairly compact and non-zeolitic. Amygdaloidal, porphyritic, or glomeroporphyritic textures are noticed locally. The vesicles are filled by secondary minerals like zeolites, quartz, calcite or some earthy or ferruginous material. Well-developed columnar joints and spheroidal weathering are characteristic features of the massive basalts. Weathered zeolitised traps occur in the river beds and bluish grey, soft volcanic ash beds are encountered locally. The basalts are composed of laths of plagioclase feldspars (andesine to labradorite), audits, pigeonite, glass, and minor amounts of opaque ores. The basalts in the Narnala and other hills in more or less east-west alignment display dips towards north. The basalt exposures on the high hills as well as the rocks met with in boreholes show a large number of joints, both vertical as well as basal. Columnar joints are more conspicuous in massive basalts. The boreholes also encountered jointed basalt

### III.2.3 Inter-trappeanbeds:-

These represent sedimentary, lacustrine or fluvial deposits intercalated with the lava flows and presumably laid down during the interval between successive lava eruptions. Such beds have been reported at the following places in Akola tahsil: —

(i) From the hills, 9.6 km. south of Wahan village

(20029, 50'/: 70°9'50") close to the Katepurna Dam site near the villages Vastapur (20028'30": 70°81') and Khambora (20°36:77°12'), and, (ii) In the hills close to the village Donad Buzurg (55 H/2, 20°34, 77°10'30").

### III.2.4 Conglomerates, Kankar, Alluviumand Soils:-

In the alluvial tracts, a fairly thick alluvium is underlain by layers of false bedded sandy soils, conglomerates and yellowish, hard calcareous kankary beds. Near Donad Buzurg the Katepurna River flows over a bed of recent conglomerates and sands. The black soil or Megur is clayey.

### Study Maps are as follows –



## IV. Discussion & Conclusion

The satellite data used in the study is acquired from the various satellites and sensors and was used in the form of geo-coded false colour composite. Formorna watershed, LISS- III data 2008 covered by Path- 102 and Row- 55, 102 and 49, 102 and 50 was procured in the form of digital data. The feature are distinguished using the interpretation keys tone, texture, size, shape, and association are used to interpret land use pattern. The database is created using various techniques for the morna watershed. The drainage map is digitized from LISS-3 Image using Arc info software. The land use /land map created using Digitization method in ARC INFO software. Other thematic layer like Drainage,



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