

# GANGA

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*Amlasole stream*

Sahara, the world's largest desert creates a kind of fear in human mind, the hot scorching sun burning over vast 46 Lakhs Sq Km of expanse of sand, stretching from Red Sea to Atlantic Ocean. Water is the single most precious thing in this land of sun and sand. But it was not like that. Scientists found that nearly 130,000-100,000 years back there were 3 large rivers, flowing through this

vast land, which are now buried under the sand dunes.

One can imagine that when flowing, these rivers, viz. Irharhar, Sahabi and Kufrah created large fertile land with green vegetation and bountiful habitats for animals that created 'green corridors' across the region. Apart from the rivers, scientists also mentioned about massive lagoons and wetlands in northeast Libya. It is fascinating to imagine that 100,000



years ago these three huge rivers with vast water used to flow across the Sahara desert to the Mediterranean and that our ancestors could have walked alongside them.

When we look our present large rivers full with human habitats, large cities and numerous villages, we do not know what future is waiting for them and our descendent.

### **NEWS**

#### **IRBMS initiative in the upper catchment of Subarnarekha River.**

Integrated River Basin Management Society is engaged in a number of livelihood activities in the forest based land for overall development for the tribal communities in Amlasole village, West Medinipur district, West Bengal. The work involves livelihood training, skill upgradation program in sericulture, vermiculture, agriculture, mushroom cultivation, bee keeping, fishery, animal and bird rearing, pond excavation, rain water harvesting etc. This measure is to protect the upper catchment of Karsoti river, a tributary of Subarnarekha, from deforestation.

This will enable the local tribal communities to take up sustainable economic activities and for the overall development in Amlasole, Amjhrna, Kankrajhar, etc., in Binpur II Block, West Medinipur district, West Bengal. This initiative is a collaborative effort of the Bose Institute, Kolkata, an autonomous Institute for scientific research, financed by Ministry of Science and Technology, Dept. of Science and Technology, Govt. of India, Amlasole Birsha Munda Gramunnayon Committee, a local CBO, Catalyst, an NGO working in this area and IRBMS.

#### **Extinction of Biodiversity in the Chandrabhaga river**

The Chandrabhaga and Bakreswar Rivers are two important tributaries within the Mayurakshi basin. Green activist Subhas Datta had moved a petition before the National Green Tribunal, Eastern Zone Bench, pointing out to the pollution caused to these rivers due to overflow from the fly-ash pond of Bakreswar Thermal Power Plant (BKTPP). The bench had in turn sought a report from Dr. Kalyan Rudra, Chairman, West Bengal Pollution



Control Board on January 22 this year. He has submitted a detailed scientific



report providing recommendations to reclaim and restore the Chandrabhaga river ecology to the tribunal. The report is pointing out that there has been a total extinction of biodiversity in the Chandrabhaga river. The pollution load is due to the overflow of the ash pond overflow of the thermal power plant. No sign of aquatic life could be witnessed.

BKTPP claimed that the supply of high ash content coal are the main reason for such pollution. Use of such coal generates more ash and the flyash pond gets filled up faster. The capacity of BKTPP was 630 MW in 2000. This rose to 1,050 MW in 2008. This expansion required more capacity of the flyash pond. But power generation was initiated without installation of additional ash ponds due to non-availability of land as

reported by BKTPP authority. This resulted in huge ash pond overflow that contaminated the Chandrabhaga River, the report states. It has been calculated by Dr. Rudra that the amount of fly ash that needs to be removed from the river bed is nearly 200,000 cubic metres.

[Source : Times of India : 26.02.2015]

## **RIVERS OF INDIA**

### **Rivers of Bihar and Jharkhand**

#### **Kiul River**

Kiul river is a tributary of river Ganga. It originates from the Tisri Hill range in Giridih district of Jharkhand. It flows along the boundary of the district for a short distance, then it enters Jamui district of Bihar through a narrow gorge near the Satpahari hill. It first flows in an easterly direction close to the southern base of the Girdheswari Hills. It turns northward at their eastern extremity, and passes near the town of Jamui. About 4 km. south of Jamui, it is joined by Barnar; below this point, it receives the mountain stream Alai, and near Jamui railway station, it is joined by the river Anjan. It then flows northeast up to Lakhisarai, in Bihar. It passes below the



railway bridge between Kiul junction and Lakhisarai station, and is joined near Rahughat by the Harohar (Halahar or Harhobar), a continuation of the Sakhi river. After this, it turns due east, and falls into the Ganga near Surajgarha. Until it meets the Harohar, the Kiul has broad sandy bed, and in some places is as much as half a km. wide, though it contains very little water in summer. In the course of its run, the river traverses a total length of 111 km., and drains an area of 16,580 sq. km.

The Mokamah group of Tals lies in the Kiul-Harohar river basin, and extends over an area of 1062 sq. km. It is a saucer shaped depression, extending from Fatwa in west to Lakhisarai in the east. Its width varies from 6 to 17 km., and runs close to and sub-parallel to the right bank of the Ganga. The Harohar river, which is the main outlet channel for the Tal area, flows eastward and drains into the Kiul river. The entire Tal area undergoes submergence every year during the monsoon period from June till September. At the end of the monsoon, the agricultural activities in the upper catchment of Kiul-harohar used to suffer

from scarcity of irrigation water. The upper Kiul irrigation project has been completed in 2004 with a command area of 20000 Ha. It mainly benefitted Jamui and Munger District of Bihar.



*Upper Kiul Dam.*

*(Image source INDIA-WRIS)*

#### **Kanhar river :**

The Kanhar river is a tributary of the Son river, and flows through the States of Chhattisgarh, Jharkhand and Uttar Pradesh.

The river originates at Gidha-Dhodha on the Khudia plateau in Jashpur district of Chhattisgarh. The origin point of this river is 1012 m. high. It initially flows north, forming the boundary with Garhwa district in Palamau division of Jharkhand. Thereafter, it flows for about 100 km. through Surguja district of Chhattisgarh. Subsequently, it runs parallel to the Son in Garhwa district in Mirzapur division of Uttar Pradesh. It



confluences with the Son river to the northeast of the village of Kota on the border of Satna and Son dist. It has a rocky bed almost throughout its course. The river has a rapid mountain torrent flowing through forested area.

The tributaries of the Kanhar river are Theme, Lanva, Pandu, Goita, Hathinala, Suria, Chana, Sendur, Kursa, Galphulla, Semarkhar, Riger, Cherna nala etc. The river forms a catchment area of 3030sq. km.

A number of waterfalls are located along the track of the river. Paval falls near Kothali village (Balarampur) is of about 61 m. Gursindhu falls is located in Chinia community block, some 40 km. from Garhwa. Sukhdari falls is 30 m. high and is located near the meeting point of the border of Chattisgarh, Jharkhand and Uttar Pradesh.

Kanhar Hydroelectric project and Kanhar river development scheme are centered on Kanhar reservoir at Baradih in Garhwa district. There is another dam/reservoir near Chinia village. The Kanhar Sinchal Pariyojana is located downstream of the confluence of Pagan river with the Kanhar near village

Sugawaman in tehsil Dudhi of Sonebhadra district.

Kanhar Irrigation Project is located downstream of the confluence of River Pagan and Kanhar near village Sugawan of District Sonebhadra, Uttar Pradesh. It was originally approved by the Central Water Commission in 1976. As per a progress report of the project for 1998-99, the construction work is completely abandoned since 1989-90. Since then, there are numerous occasions when the project was inaugurated. However, no work could be taken up. Recently on 5<sup>th</sup> December, 2014 after a span of 25 years, inauguration of construction of the dam started without a fresh proper cost benefit analysis and Environment Impact Assessment or Social Impact Assessment, the commencement of project activities is making way for a large social unrest.

The project proposes a 3.003 km long earthen dam having a maximum height of 39.90 m from deepest bed level which may be increased to 52.90 m if linked to Rihand reservoir. The project envisages submergence of 4131.5 Ha of tribal land



which includes parts of Uttar Pradesh, Chhattisgarh and Jharkhand. The command area of the project is 47,302 ha. The project imposes enormous threat not only on the environment and ecology but also to thousands of tribal families of Vindhyas living there since hundreds of years and has demanded for protection of their forests and proper implementation of Rehabilitation and Resettlements.

*(Source sandrp.wordpress.com)*

## **Ganga the Eternal River**

### **Part-41**

#### **Mythology of River of Ganga and its tributaries**

### **Gomti**

The Gomti River is a very important tributary of River Ganga. It originates from Gomat Taal near Pilibhit. It flows 900 Km through Uttar Pradesh and meets the Ganga in Varanasi district. This is another transcendental river of Hindu mythology. It is considered as the daughter of Sage Vashist. The story goes that long back, a lotus flower manifested from Lord Vishnu's navel on which was seated Brahma. Lord Vishnu instructed

him to perform his duty as a creator to which Brahma agreed. First, Brahma created his offspring from his mind as manasputras and sought their help in increasing the population of the world by becoming householders. But, all of them were extremely virtuous and did not show any inclination towards getting married. Finally all of them went to the western coast and engaged themselves in austere penance. Their penance continued for a number of years after which 'Sudarshan Chakra' appeared before them. As all of them looked up in bewilderment, they heard a heavenly voice – "O sons of Brahma! Very soon the almighty Vishnu is going to manifest himself. The 'Chakra' you are seeing is his. You all must perform the rituals of 'ardhya' in the name of Lord Vishnu to show your reverence towards him."

All the Manasputras worshipped Sudarshan-Chakra with deep devotion. But there were no holy river, with whose water they could perform the rituals of aradhya. They then sought help from Lord Brahma. Lord Brahma instructed Ganga to go to the earth, and would be known as Gomti. He also said that sage



Vashishth will lead her to the destination and she should follow him just like a daughter follows her father. Finally, when sage Vashishth followed by Gomti reached their destination, all the Manasputras could eulogized Ganga and expressed their gratitude to Vashishth for bringing Ganga on earth. They offered ‘aradhya’ to Gomti and subsequently eulogized Lord Vishnu. Lord Vishnu appeared after being pleased and blessed them – “Your unflinching devotion in me has pleased me no bound. Since you did this penance with the objective of Moksha (salvation), this place would become famous as Moksha Dayak (giver of salvation). This sacrosanct place would also be called Chakra teerth because of Sudarshan chakra, who informed you all of my manifestation on earth. I assure you that I won’t abandon this sacrosanct place even for a moment.”

This way, all the Manasputras were finally successful in their objective of offering aradhya to Lord Vishnu with the holy water of Gomti. At last, Gomti having fulfilled her mission for which

she had descended down to Earth merged with the ocean through Ganga.

### **SPECIAL FEATURE**

#### **Categorization of watersheds :**

A watershed is a geographic area that drains to a common point. Watersheds can be categorised in a number of groups, depending upon the mode of classification used for the purpose. Common modes of classifications are outlined below:-

##### **1. Watersheds based on size :**

A watershed is termed as large, mini or micro depending upon its size which can be managed for implementation by various agencies within a reasonable time period. For example, a micro-watershed is one which has a single drainage with subsidiary branches, extending to an area within 500 ha (5 sq. km.). Mini watersheds comprises of a number of drainage systems, extending to an area from more than 500 ha (5 sq. km) to 2000 ha (20 sq. km.). A large watershed is an area including a complete drainage catchment which has



an extent of area of more than 2000 ha (20 sq. km.).

## **2. Watersheds based on drainage:**

Drainage characteristics of a watershed can broadly be related to its drainage pattern, stream density and drainage density. Drainage pattern is interpreted from the drainage map of the watershed. It depends upon the regional geology and pre and post structural control over the catchment area. Stream density is the number of streams in the watershed per unit area (sq. km.). High stream density is an indication of high inundation of the terrain. Drainage density, on the other hand, is the total length of all the stream channels per unit area (sq. km.). Drainage density indicates the drainage efficiency of the basin. A higher value of drainage density indicates a well-developed network and high run-off causing intense flood, while a low value (less than 4km/ 1sq. km.) indicates relatively moderate to low run-off and higher permeability of the terrain and less chances of inundation due to flood.

## **3. Watersheds based on shape :-**

Watershed are broadly categorised in two groups, either fan shaped (nearly

circular) or fern shaped (elongated). The shape of the watershed controls the time taken for the run-off to concentrate near the outlet point. This time is known as the time of concentration ( $t_c$ ). A fan-shaped watershed provides greater flood intensity at the outlet, as all the tributaries are nearly the same. But in an elongated watershed, the time of concentration for each tributary is different, and the discharge at the outlet is distributed over a long period and as such probability of inundation in the catchment area is remote.

## **4. Watersheds based on other criteria**

From management point of view, watersheds may be categorized into several types like, (i) hills or flat watershed based on topographical gradient, (ii) humid or arid watershed depending upon overall climate of the area, (iii) red soil or black soil watershed based on general soil character and type of the area etc.

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