RIVER SYSTEMS OF INDIA

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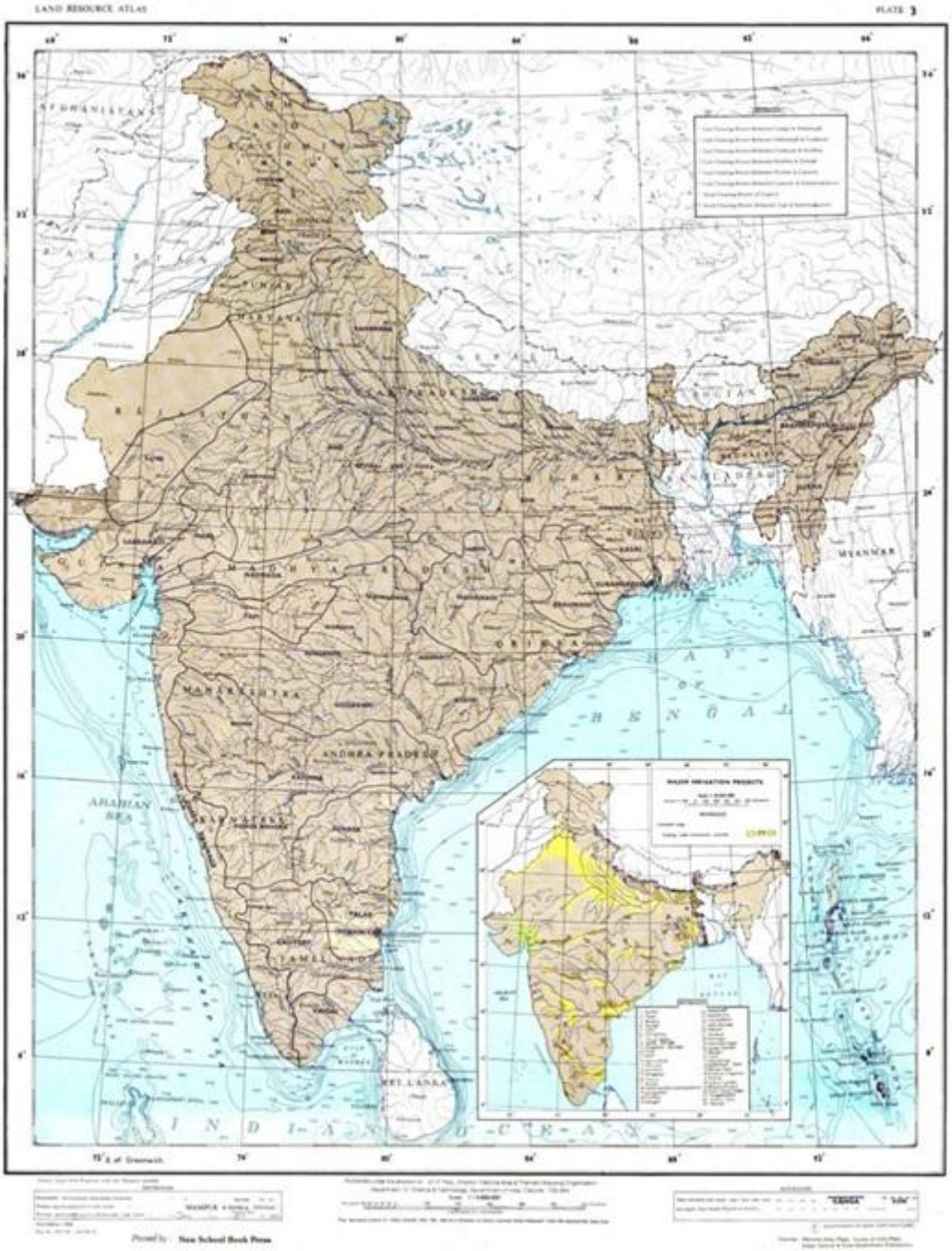

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INTRODUCTION:

River is the life line and blood line of India. The origin and distribution of the main streams and their tributaries is known as “Drainage System or River System”.

India is one of such country in the world which is bestowed with good number of rivers and tributaries, which are helpful not only in the field of agricultural but also in inland transport system of the country.

Rivers also form the basis for domestic and industrial water supply, generation of hydro-electricity, inland fishing, are responsible for deposition of fertile soil in the plains as well as formation of deltas.

Some river basins are also responsible for trapping of oil and natural gas which also contribute to the list of usefulness of these rivers.

Most of the rivers in India either flow into the Arabian Sea or the Bay of Bengal, which is determined by the water shed and the physical features of the country.

The drainage system in India can be broadly divided into 2 groups namely:

1. The Himalayan Rivers and
2. The Peninsular Rivers .

Sub Units

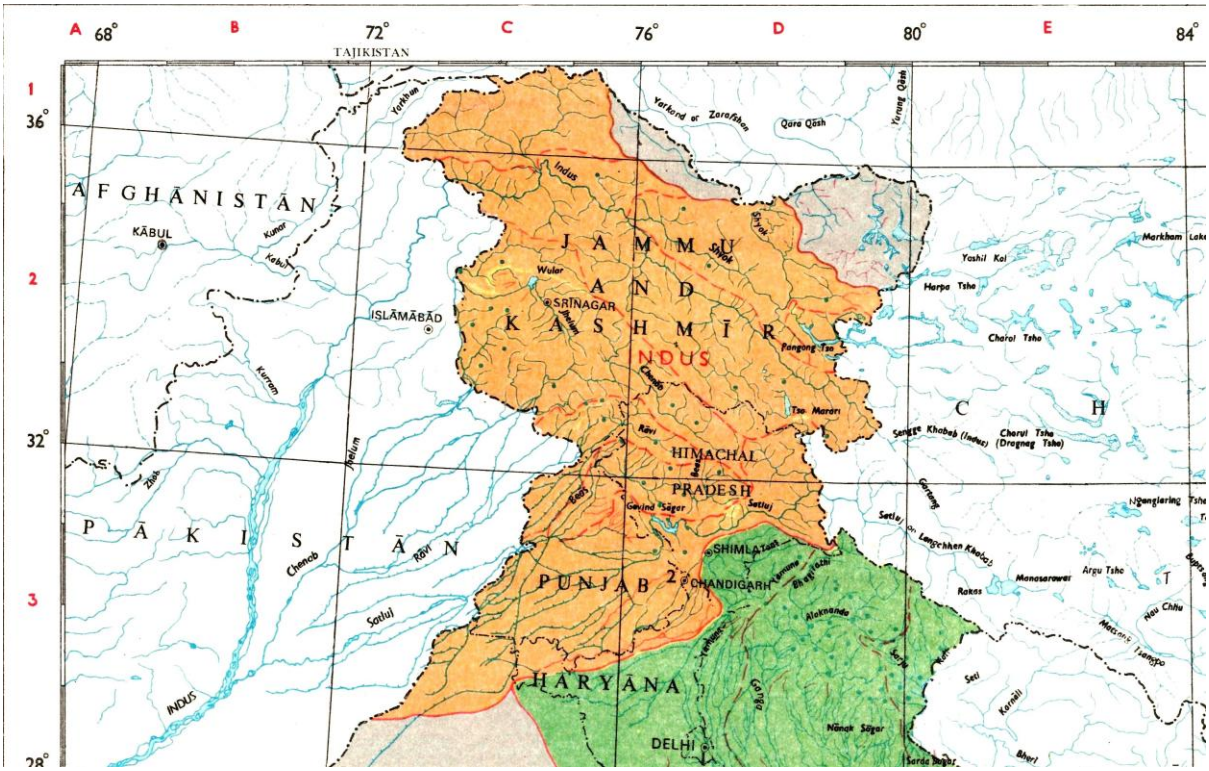
1. **Major River Basins:-**

In India, the Ganga, the Indus, the Bhramapurtra, Mahanadi, Narmada, Krishna and Cauvery are attributed as the major river basins.

2. **Himalayan Rivers**

The important river system of north India are also known by the term “The Himalayan Rivers”.
The Indus, the Ganges, and the Bhramaputra along with their tributaries form the most important river systems.

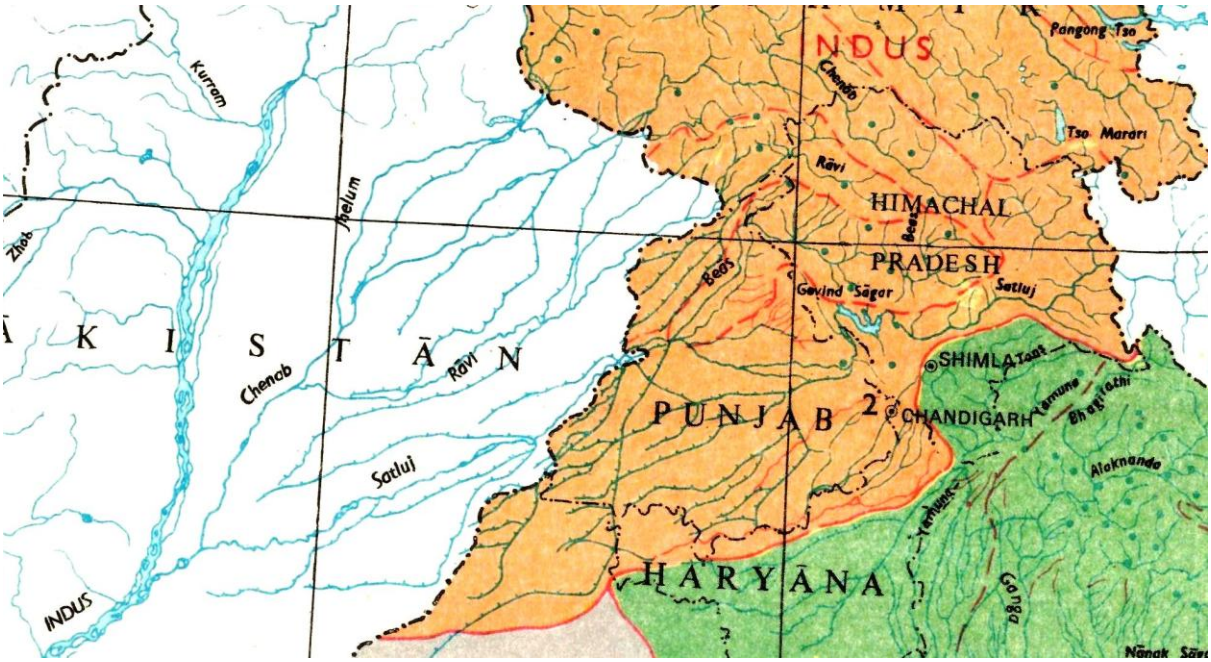
a) **The Indus:** Indus or Sindhu in other words rises in Tibet (Mt. Kailash) at an elevation of 5000mts above MSL. Though its initial flow is North-West wards between Tibet and Ladakh. IT enters Indian territory through a deep gorge namely the Indus George in the Himalaya and flows 709 Kms through India. In India, it is joined by its tributaries namely **Shyok, Shigar, Gilgit and Zaskar**. The total length of its flow being 2897kms where in having a catchment area of 5,96,8000 Km2.



Being one of the largest river systems of the world flowing through India and Pakistan, where in the majority of its course and catchment area being in Pakistan.

After entering the plains in India the river Indus is joined by many tributaries such as the Jhelum, the Chenab, the Ravi and the Beas along with Satluj.

The Satluj, being one of the most important tributaries of the Indus flowing a length of 1050Kms, and draining 24,087Km2 in India. This river rises in lake Rakhas in Tibet is of immense value of the states of Punjab, Haryana and Rajasthan.



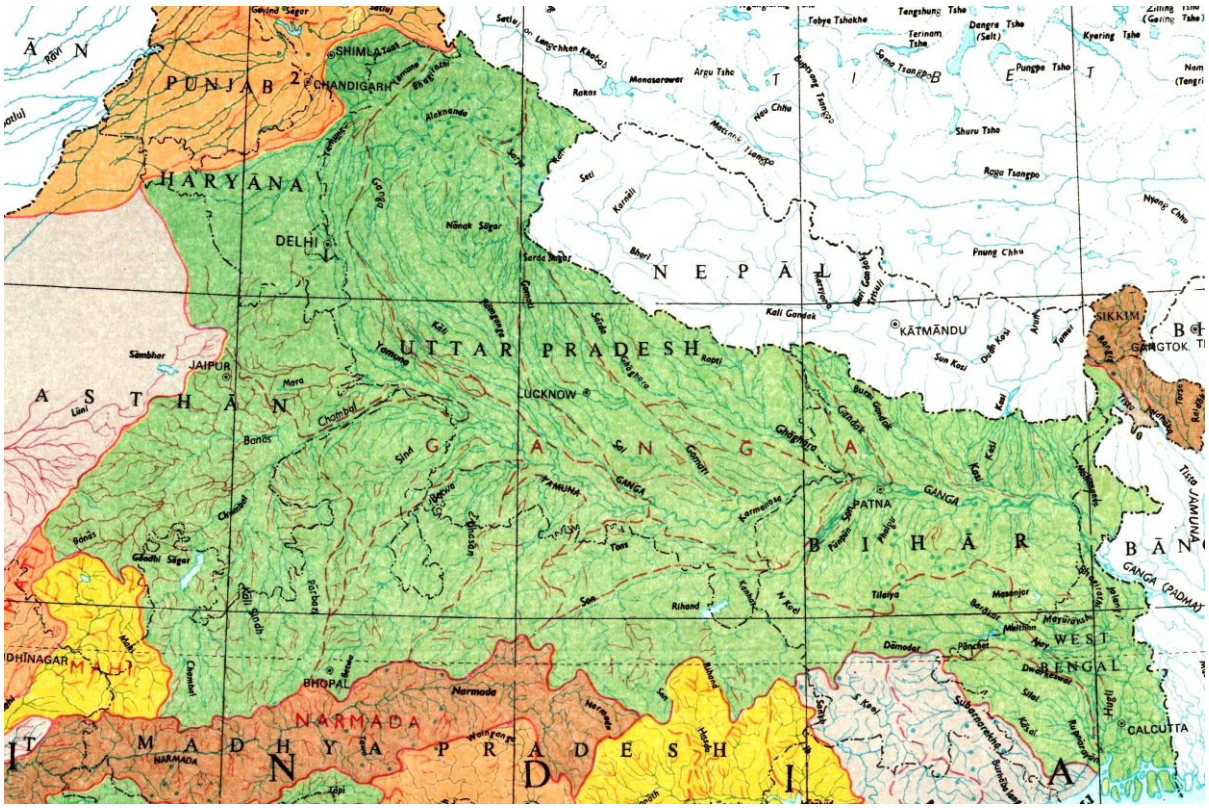
Jhelum meanders through the Kashmir valley rising as a spring at verina.

Chenub rises in the greater Himalayas joining the mighty Indus in the plains.

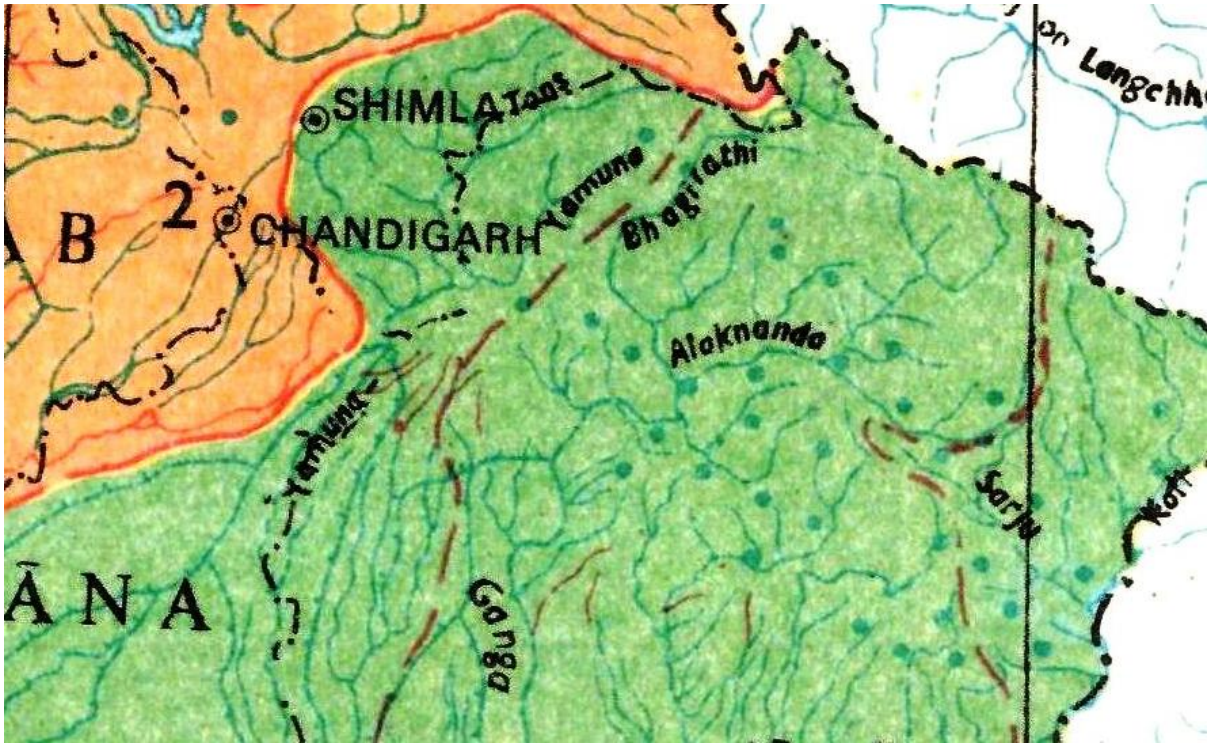
Ravi and Beas rise from Kulu hills and join the Chenab and Satluj respectively at Harike.

b) **The Ganga:** Ganga is the largest river system of India flowing overa length of 2525 Kms and draining an area of 9,51,600, Km2 which is 25% of India's total surface.

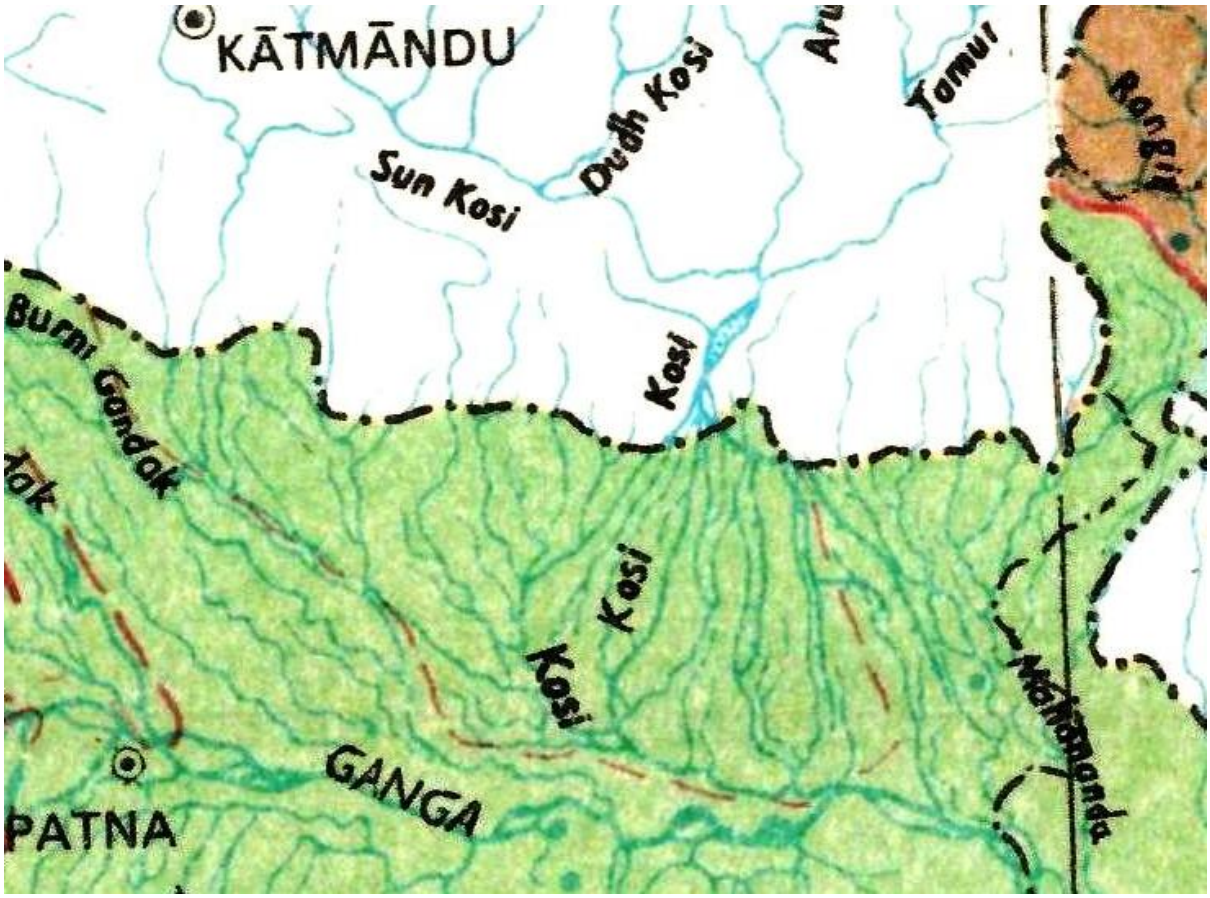
The Ganga has 2 main head streams namely the 'Alakanada ' and the 'Bhagirathi' rising at 'Garhwal' and gangotri glacier at Gomukh (finally meeting at'Devaprayag' to flow as Ganga. After flowing across the Himalaya Ganga enters the great plains of Haridwar from their flowing towards South, South-east upto "Mirzapur" in Bangladesh cutting across Bihar and West Bengal joining the Bhramaputra, as padma before flow into the Bay of Bengal.



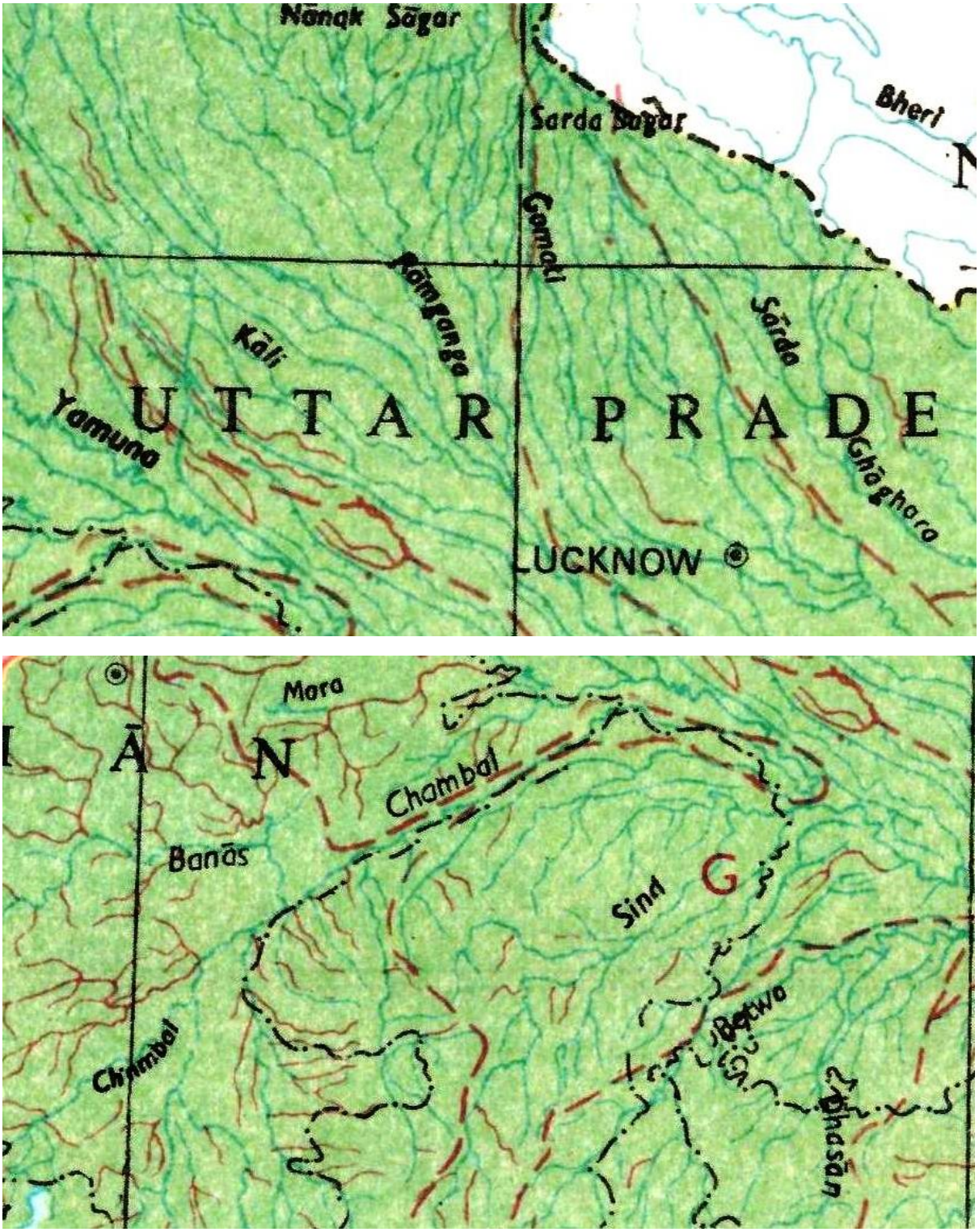
Ganga has many tributaries joining her namely the Yamuna, Son along with Ramaganga, Ghaghara, Gandak, Gomathi, Sarada, and Kosi of which Yamuna belong comparatively longer rising from Yamunothri Glacier joining Ganga at Allahabad having a total length of 1376Kms with a catchment area of 359000Km2.



The Kosi frequently termed as “the sorrow of Bihar” rising in the mighty Himalay before joining the Ganga at Bhagalpur.



The Sum rises on Amarkantak Plateau before joining the Ganga at Dehri



The states of Uttar Pradesh, Madhya Pradesh, Bihar, Rasjathan, West Bengal, Hariyana, Himachal Pradesh and Delhi are being benefitted states as many of the irrigation and power projects have been taken up in the Ganga basin apart from the Ganga surving as an inland water way all along its course. The famous pilgrimic center of Haridwar, Gaya, are located on the banks of Ganga.

c) **The Bhramaputra:**

The "Tsang Po" (meaning purifier) or the Bhramaputra rises from Chemayundung glacier flows for 1200Kms parallel to Himalaya before entering India through the Dihang Gorge in Aurnachal Pradesh. After entering the Assam valley "Tsang PO" is known as the mighty "Bharamaputra".

The total length of the river Bhramaputra being 2580Kms draining an area of 5,80,000Km2.

The mighty "Bhramapurtra" has many important tributaries namely Dihang, Dibang, Subansiri, Dhansiri, Kameng, Kopoli, Bhareli, Lubit and Tista.

Recently the Chinese Government has proposed to construct a dam across the Bhramapurtra for providing Hydro-electric and navigation facilities to Tibet as Bhramaputra is flooded during rainy seasons.

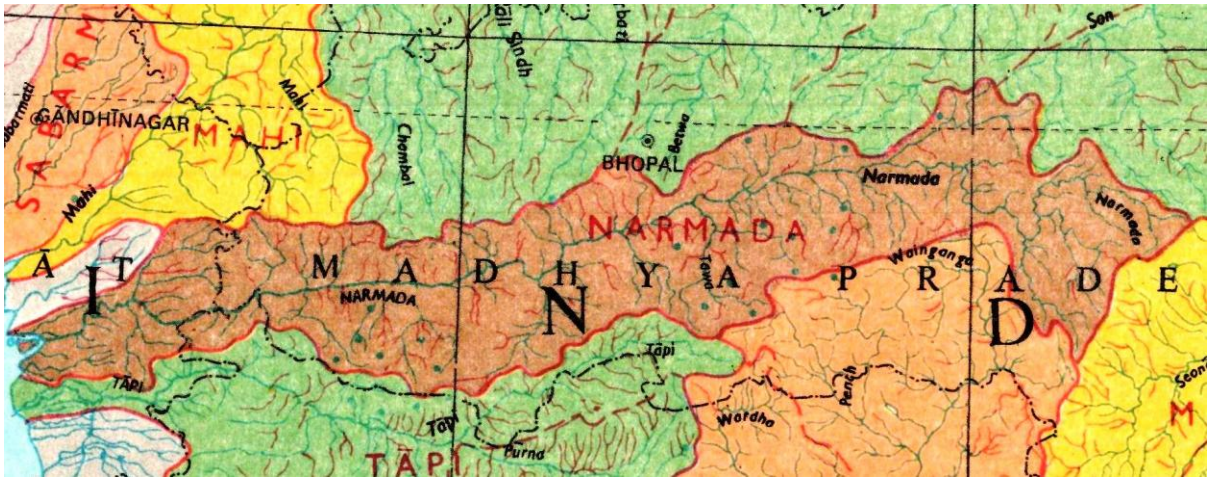
3) Peninsular Rivers:

The Cauvery, the Godawari, the Krishna, Mahanadi, the Narmada and the Tapti along with their tributaries are known as the Peninsular rivers. The rivers of Southern-India can be grouped into west-flowing rivers and the East –flowing rivers.

The West –flowing rivers:

The Narmada, Tapti, Sharavathi, Kali, Nethravathi and the periyar are some of the west flowing short and swift rivers having their source in the rugged topography of the western ghats.

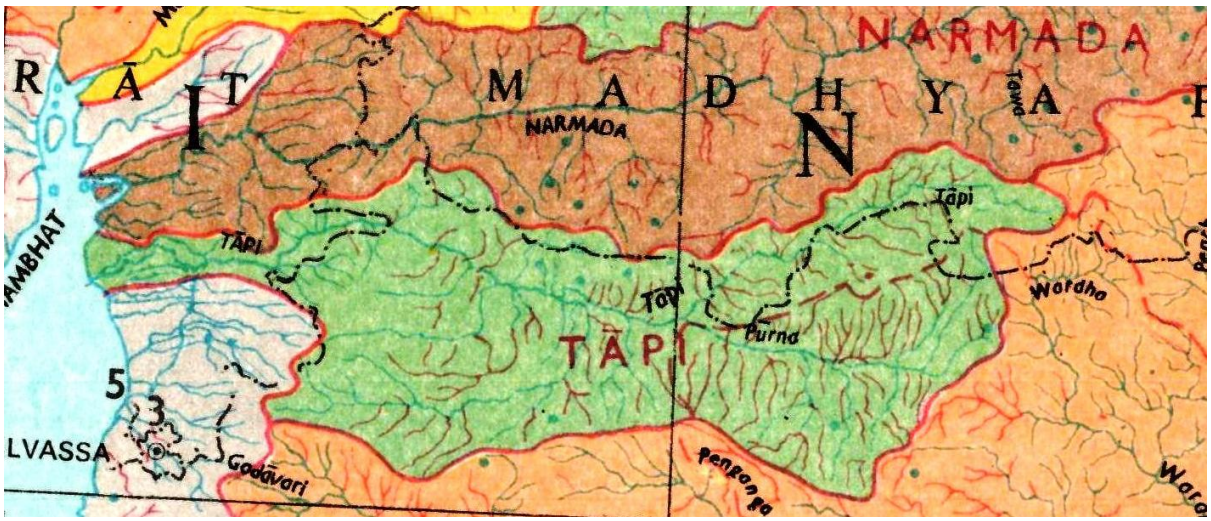
a) The Narmada: IT is one of the largest among the west-flowing rivers rising in "Amarkantak" hills in Maikala, Madhya Pradesh, flowing a total length of 1312Kms through the states f Madhya Pradesh, Maharastra and Gujarath before flowing into the Gulf-of Khambhat having a total catchment area of 98,796Km2. All along its course the Narmada river flows through the Marble rocks forming water fall called"Kapildhara".



Narmada's main tributaries include the Burhner, Banjar, Shar, Shakkar, Dudhi, Hiran, Orsang and Barna.

b) The Tapti:

The second largest among the west-flowing rivers rising near Multai in Betul district of Madhya Pradesh. The Tapti has a total length of 724 Kms through the alluvial plains of Surat before flowing into the Gulf of Khambhat, having a total catchment area of 64,750Km2, flowing through a rift valley in the Satpura and Ajanta Ranges.



The main tributary of Tapti being the Purna followed by others such as Betul, Patki, Ganjal, Dathrani, Bhokar Suki, Manki Guli, Arunavathi, Gomai, Khandu and Amravathi.

c) The Sharavathi:

Rising near "Ambuthirtha" in Shimoga district, flowing west wards through Shimoga and Northern Kanara districts to a total distance of 132Km before joining, the Arabian Sea near Honnavara.

The Haridravathi and Ennehole being its main tributaries join as it flows through the magnificient Sahydri before ending up as a falls namely the “Jog falls” where in she falls from a height of 275 mts.

d) The Kali: Rising near “Supa” in Northern Karnataka district flowing westward through a narrow Gorge for a length of 161Km before joining the Arabian Sea near Karwar. It receives small tributaries like Tatterhalla, Pandri, Kaneri and Madri before ending up as a waterfall at a place called “Lalguli”.

e) The Nethravathi: Rising in the “Ballalarayanadurga” of Kudhremukh ranges in Chikmaglur district flowing for a length of 160Km before joining the Arabian Sea at Bunder in Mangalore having Charmudi, Shishila, Phalguni, and Kumaradhara as its major tributaries.

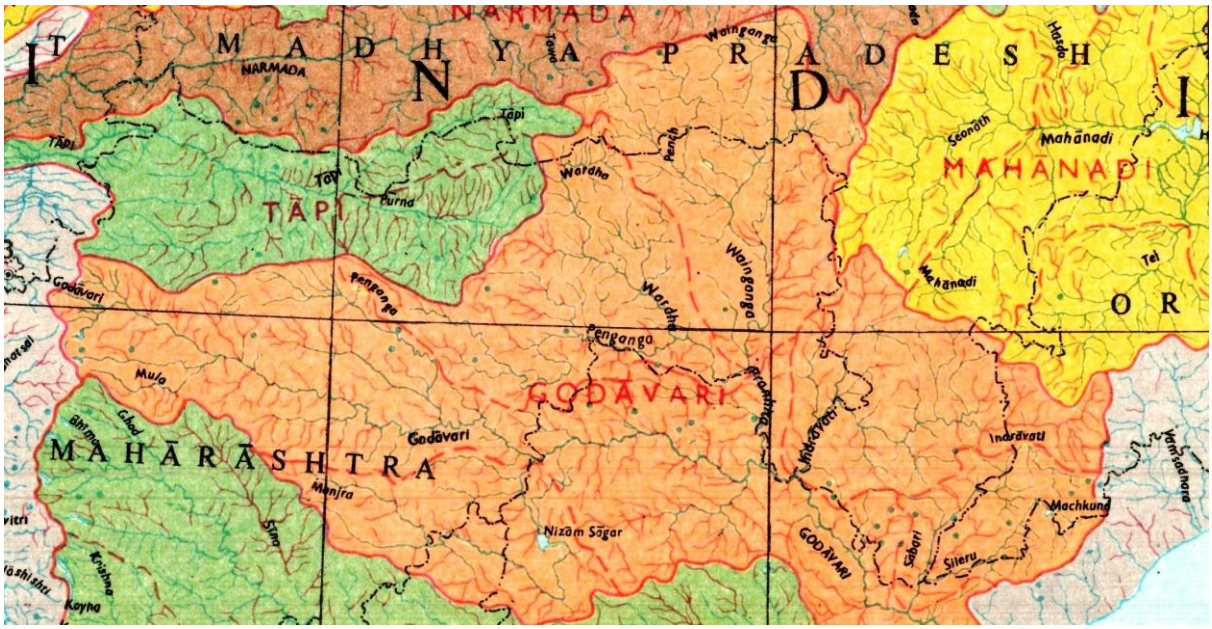
f) The Periyar: Being one of the largest river of Kerala having a total length of 225Km, taking her birth from the “Shivagiri” forest turning to west before flowing into the Arabian Sea at “Pallipuram”. It is the only river among the west flowing rivers Navigable for 160Km in land from the mouth of the river.

East-flowing rivers:

The important East-flowing rivers of peninsular India are the Mahanadi, the Godhavari, the Krishna and Cauvery apart from many others like the Damodar, the Brhamani, the Palar, the Pennar, the Vaigai and “Thamara bharai”

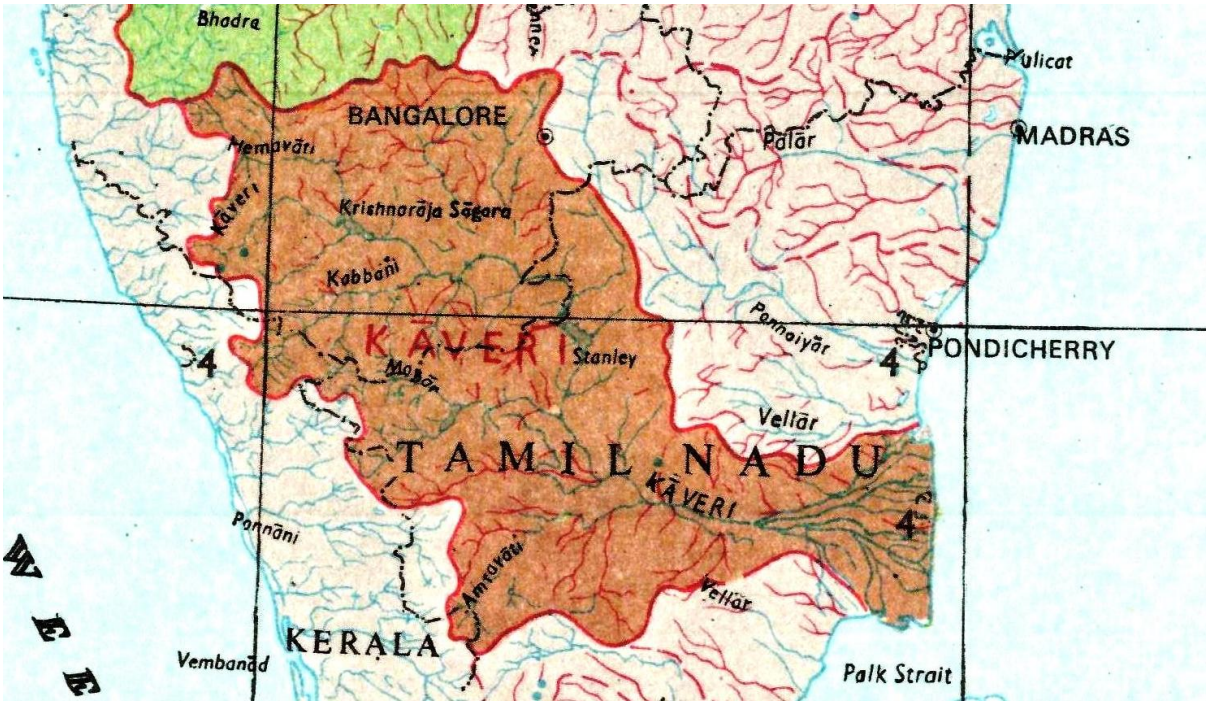
a) The Mahanadi: Rising in the Siwaha ranges (Chattishgarh) initially flowing towards the North then towards East then finally towards South passing through the states of Chattishgarh and Orissa. Its total length being 851Kms having a catchment area over 1.41.590Km2. It is joined by many of its tributaries namely Seonath, Hasdeo, Mand IB and Jonk. Many irrigation and power projects namely the Hirakud, Naraj and Tikarapara dams. This river is very useful to Orissa as it is Navigable in its lower courses.

b) The Godavari: The Godavari rises in “Triambak” near Nasik “Maharashtra” with a total length of 1465Km having catchment area of 3,12,812Km2. IT is one of the longest river system of South India flowing through the states of Maharashtra, Madhya Pradesh, Southern Chattisgarh and Andhra Pradesh before joining the Bay of Bengal near “Kakinada” with major tributaries such as “Manjra”, Pen0ganga, Wainganga, Vardha, Pranahitha, Indravathi and Sabari. It is navigable along its lower course and many power and irrigation projects have been taken up in the basin.



c) The Krishna: Rises near Mahabaleshwar in the western ghats flowing for a distance of 1400Km through the State of Maharasthra, Karnataka-Northern Part and Southern Andhra Pradesh with a total catchment area of 2,59,000Km2 before entering the Bay of Bengal near Divi. Its main tributaries include the Koyna, Yerla, Varma, PAnchaganga, Dudh-ganga, Bhima, Ghataprabha, Malaprabha, Tungabadra and musi of these Tungabadra and Bhima are the most important one's. The stream Tungabadra rises at Gnagamula in Chikmagluru district and meet at "kudli" in Shimoga district flowing a distance of 640Km before joining river Krishna at "Alampur" in Andhra Pradesh draining an area of 69,562Km2. The Bhima rising near "Bhimashankara" in the western ghats with a total length of 867Km before joining Krishna near Raichur many dams and power projects are constructed across the river Krishna and its tributaries has the catchment area of river Krishna is over 6144Km2.

d) The Cauvery: Yet another important river system of South India also known as "The Ganga of South India" with its principle river flowing through South Karnataka and Tamil Nadu. Rising in the Bhramagiri hills at place called "Talacauvery" in coorg district flowing a total length of 805Km before joining the Bay of Bengal at "KAveripatanam" in Tamil Nadu having an catchment area of 80290Km2 with tributaries such as Hemavathi, Harangi, Lokapavani, Arkavathi, Simsha, LAkshamana Thirtha, Kabini, Suvarnavathi, Bhavani and Amaravathi all along its course the river flows in series of Rapids and broken cascades such as Chunchunkatte, Shivanasamudra and Hongenekal falls.



The river Cauvery is very important for irrigation and generation of power as an estimated 90% of its surface flow has been utilized.

4.Water Resource potential:

Water being the basic resource as well as necessity for survival of life has been synonymously associated with life. There by understanding the water resource potential has assumed importance.

It is well established fact that 97% of earth's water is saline only a small portion (less than 3%) is fresh. According to its distribution and availability water may be broadly classified into under ground and surface water resources.

i) Surface water resources: India being a country endure with good number of drainage system is having surface water resources as springs, lakes etc., These surface water resources play a major role in Shaping Topography and formation of soils apart from having a greater influence on human habitation.

The surface water resources in India include the streams, Canals, Ponds, lakes and Marshes. Which have a direct influence on the distribution of population?

In India the surface water resources are majorly used for domestic water supply, industrial water supply, fishing and most importantly irrigation. India being endowed with regions of permeable rock sandstone, shale, gravel and clay have giving greater potential for accumulation of ground water resources.

Some of the precipitation which falls on the land not only evaporates but much of that soaks into the ground. The part which soaks into the ground goes deeper and joins the underground water a potential source of drinking and industrial and even for irrigation purpose.

5. Natural Water Grid

The rapid growth of population and economic development in recent years have lead to greater consumption of water in the country. This has lead to scrutinize the potential water resources and integrated plan for their efficient use, management and conservation in order to meet the ever increasing demand from all sides.

India is blessed with extensive surface water resources as well as vast reserves of underground water. This is mainly due to large number of sufficient rivers and sufficiently heavy rainfall. The average rainfall in India being 800 cms and lead to flooding in some parts where as draughts in other parts.

The most important surface water source being the river systems where in the average surface run-off in the country has been assest 1,869 billion cubic mts(Bcm) of which the amount to be utilized is estimated to be 1122 Bcm. The rest 747Bcm being unutilized ending up finally in sea.

A natural water grid can be establish to utilize the 747 Bcm water by interleaking major streams, de-sitting of dams, construction of major and minor check dams all along the river course and joining major rivers such as Ganga and Cauvery has 60% of the total surface water resource in India is contributed by Ganga and it also being perennial in nature i.e., water being available all the 365 days.

By diverting water from surplus regions to water scare and draught prone area will considerably abate the distress situation which being the major aim of establishing natural water grid. The best example being Rajastan Canal project where in the waters of Himalayan rivers brought to the chronically thirsty land of Jaisalmer and Bikaner divisions in the desert state of Rajasthan. Similarly Yamuna Canal project transfer waters from Ganga to irrigate a vast tract of dry Ghaggar basin in Haryani and adjoining state of Rajasthan.

Similarly in the south the draught prone areas of the states of Karnataka, Andhra Pradesh and Tamil Nadu can be freed from such disaster in near future by considering interlinking of the Himalayan rivers with that of Peninsular rivers via transfer of water which forms the main plan form National water Policy, (1987).