

FROSTALK-Feb.19,2022

MANAGEMENT OF RIVER BASINS OF ODISHA—
ISSUES AND CONCERN.

R.C.Tripathy, Ex. Engineer-In-Chief(WR), Odisha.

1. River Basins of Odisha.

- Odisha has drainage areas of 11 river basins-
- Mahanadi
- Brahmani
- Baitarani
- Subarnarekha
- Budhabalanga
- Rushikulya
- Vansadhara
- Nagabali
- Bahuda
- Indravati and
- Kolab

Map of Odisha with the river basins is enclosed.

2. Management of river basins

- For Odisha, the priorities for management of the water of river basins, are given below.
- Drinking and domestic use.
- Ecology.
- Irrigation and agriculture.
- Hydro power development.
- Industrial requirements.
- Navigation.
- Planning for management of water of river basins involves a multitude of considerations. It is not intended here to deal with all, but to highlight those vital issues, over which diverse views are expressed and those for which specific considerations are needed.

3. Creation of conservation measures

- Man can not do without conservation of water. River water can be conserved by creation of storage structures, which can be small, minor, medium or major ones. Storages are needed for the river basins and for areas outside which suffer due to inadequate water availability.
- Selection of optimum size of storage or diversion structure should be site specific and justifiable for the needs of the state.
- Large structures are more reliable for extreme dry weather conditions and for holding back a larger quantity of water temporarily, for flood moderation.
- Rehabilitation and **resettlement** of displaced persons is the major cause of concern for dams. The RTFCLAR act of 2013 and state amendments go a long way to mitigate the miseries of the displaced.
- Structures like contour bunds, check dams, weirs, barrages and dams have their own utility and the optimum size and type should be adopted, depending on the configuration of the area and the needs.
- A series of check dams can not be equivalent to meet the needs, where a barrage or dam of optimum size will be effective. Sustainability of small structures is a source of concern.

4. Instream storage structures.

- Many in-stream storage structures are now planned for execution in Odisha.
- Boundary conditions have to be suitably set for these structures.
- Setting the river bank level as the pond level and looking for sites with zero rehabilitation will not give us a justifiable structure.
- The high flood level of the river at the specified location should be the pond level and gates can be provided to limit the MWL of the structure at that level to pass the flood discharge.
- Suitably planned free board and river training works will enable the structure to pass a higher discharge and can enhance the valley storage capacity of the basin thereby moderating the flood peak to some extent.
- Resettlement, if any, should be for the encroachers into the flood zone and may not be a real problem.
- These multipurpose structures (for irrigation, green energy development, drinking water supply, pisciculture, water sports, industrial use etc.) can be executed with cost sharing among the line departments and industrial establishments. These structures can facilitate growth of inland navigation and ground water recharge.
- Multiple benefits will be alluring and can change the living standards of the inhabitants.

Slide 6

RT2

Ramesh Tripathy, 17-02-2022

5. Structural methods of flood protection

- Flood protection is a major requirement of management of river basins.
- Flood protection to specific areas can be given by ring bunds or river embankments, with adequate provisions for drainage.
- Shape and location of river mouth can affect the discharge capacity of the river, which can be improvised by model studies. Where the river meets the sea, the littoral drift along with the tidal pattern may affect the discharge.
- Roads, railways or canals crossing a river may cause flood upstream, unless adequate water way is provided for high flood discharge. The effect can be seen in other branches of a river, if the restriction causes afflux in one stream.
- Sand mining from the river beds is a serious issue, for which location and dimensions should be technically decided and meticulously followed. This can restore the regime of rivers, if suitably executed and observed.

- Large reservoirs can moderate floods more effectively.
- Where sufficiently large reservoirs can not be constructed, a larger free board or flood lift may be considered with smaller storage volumes. This may submerge some areas temporarily in extreme cases which have no permanent structures or specific structures can be protected by bunds. Such an arrangement can moderate a flood peak to an acceptable limit.
- Drainage problems behind embankments or ring bunds have to be addressed suitably. Luna Chitrotpala doab (Gahagapat) has the NSL below the surrounding river bed level and is a live problem needing acceptable solution.
- Non-structural flood control measures like, flood forecasting and warning, flood plain zoning etc. are also necessary.

6.Environment management and Pollution control

- Environment management of river basins is of utmost concern covering many aspects. Pollution of rivers and water bodies needs special mention.
- River pollution can be minimized greatly by public participation.
- Training of river banks and sections to restrict soil erosion and gulley formation. Plantation of trees of suitable species and their protection will help.
- Investigating into the causes and evolving solutions is proper. Use of chemicals in household water treatment and chemical fertilizers can pollute even ground water.
- Not allowing sewage, septage, industrial and hospital discharges into the stream without treatment, must be ensured.
- Suitably restricting the use of water bodies to discharge religious wastes and chemical contents." Sandhya Arati" at river banks near areas of habitation can raise people's consciousness on the matter.
- "Polluter to pay" has to be implemented.

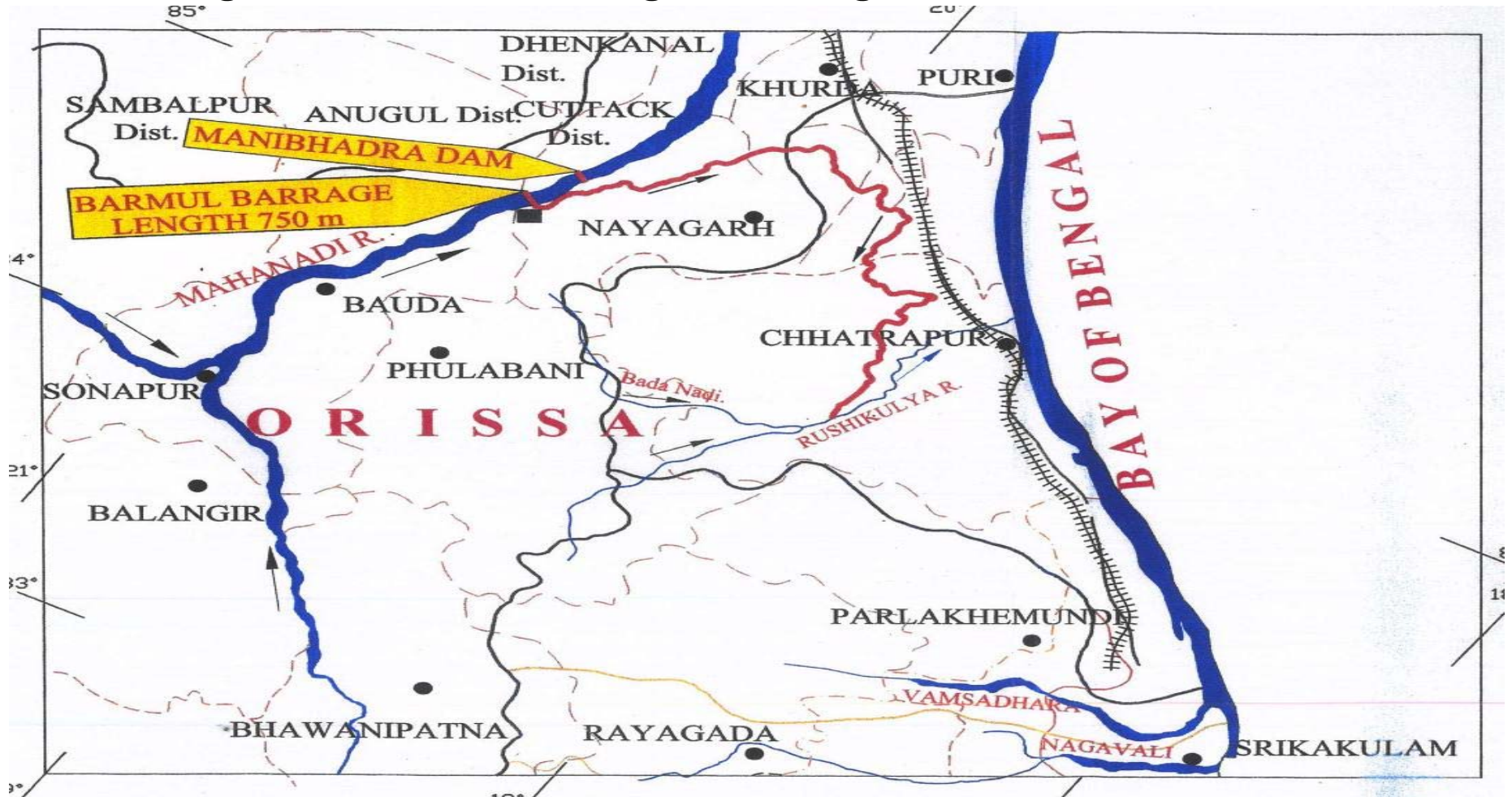
7. Weed control

- Growth of weeds in water bodies is a problem for which no satisfactory solution has been evolved.
- Mechanically/manually cutting the weeds, transporting to designated area and converting into compost is yet to be satisfactorily developed.
- Biological methods involving fish (grass carp etc.) and a variety of moth have not been satisfactorily evolved .
- Chemical methods appear to be risky.
- Weeds in Hirakud power channel are said to be the result of discharge of biological (including Hospital)wastes from Burla and areas surrounding the lake.
- Weed problem is seen where canal is let into a pond(stagnant water body) and then taken out. Sason and Rushikulya canal systems are examples, so also Kalo system.
- Avoiding the above situations can be a good preventive.

8. Inter-linking of rivers-

- The concept is idealistically exhibited in public, but is practicable to a limited extent.
- Rivers are state subjects, as per the constitution.
- All the states have plans to fully utilize the water of river basins within their jurisdiction, although the percentage of actual utilization is different from basin to basin. As such no surplus water is available to be diverted.
- A storage structure is needed at the beginning of the link canal and new structures are opposed (even for local use) by many.
- Unless the source is perennial, the link canal carries water during monsoon only and remains dry during other periods.
- It is a myth that inter-linking of rivers can control floods.
- It may be easier to explore alternatives.

- For Odisha, inter-linking of Mahanadi with Rushikulya can be advantageous. A tentative alignment is given here.



9. Necessity of Acts and Laws

- Several serious issues can, possibly, be resolved, if suitable Acts and Laws are enacted.
- Some times Rules and Guide lines are not followed by the Authorities, while executing storage structures. No Acts/Laws are there against such activities and hence no remedial/compensatory measures can be taken.
- In cases of Inter-state river water disputes, usually the parties express dissatisfaction over the Award. Alternative dispute resolution methods , including agreeable physical exchanges, need elaborate deliberations and enactment. Creation of accredited multi-disciplinary mediation agencies can be a practical step forward. Certain aspects of inter-linking of rivers have also to be covered under this Act.
- In recent years, cases have come up, where river reaches are sold out to private parties to arrange funds. This creates local problems and has inter-state implications. Legal modalities need to be enacted.
- Scope of Dam Safety Act should cover structural and peripheral safety, along with adequacy of provision and operation of control equipments (gates, hoists etc.) for achievement of designed goals. An independent autonomous body is needed to ensure compliances.

The above matters need central enactments for justifiable results.

10. Concluding remarks

- Management of river basins is a vast topic and it is attempted here to bring out a few issues which need wider sensitization and focused attention of serious thinkers.
- Inland navigation could not possibly, stand competition against road transport in Odisha and is languishing, even as several structures like, lock chambers and lock gates in canal systems bear witness.
- Peoples' objections to major storage structures are mainly from apprehensions of displacement and have to be handled sympathetically.
- There is necessity of Acts and Laws on several issues and serious concern is expressed for addressing those issues.