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*With you in Pursuit of Sustainable
Management of Finite Water Resources*

Chief Editor
Sayali Joshi, CEO

Editorial Board
Dr. Pramod Salaskar
Pallavi Patil
Pradnyesh Agre

Contact: Executive Editor, Shrishti Eco-Research Institute, B-106, Devgiri, Opp. P. L. Deshpande Garden, Near Ganesh Mala, Pune - 411 030. India. Phone: 91-20-24253773 / Telefax: 91-20-66206539

Website: www.seriecotech.com Email: seri_news@yahoo.co.in

Point for discussion this month **Feasibility of interlinking of rivers**

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Eternal Words

It is imperative to maintain portions of the wilderness untouched so that a tree will rot where it falls, a waterfall will pour its curve without generating electricity, a trumpeter swan may float on uncontaminated water - and moderns may at least see what their ancestors knew in their nerves and blood.

~Bernand De Voto, Fortune, June 1947

In its broadest ecological context, economic development is the development of more intensive ways of exploiting the natural environment.

~Richard Wilkinson

Dear Readers,

It's now very hot summer in India. Many of the remote villages are facing water scarcity problem. Every year, in the summer it is a challenge for government agencies to provide good water supply to the aggrieved people in those villages. Year by year situation is becoming worst.

At the beginning of 19th century most of the rivers in Indian continent were perennial but the scenario changed very drastically in 20th century. Due to huge constructions and infrastructural development there is speedy change in the catchment of these rivers and hydrologic cycle of the basins. The rain water percolation through soil and slowly reaching to river with the help of underground natural furrows is reduced. So there is less feeding of water to these rainfed rivers from ground water table in non monsoon seasons.

Another problem which is engulfing these rivers is pollution from all sorts of sources ranging from residential to industrial to commercial and agricultural activities. The rivers flowing through cities are carrying huge quantity of solid and liquid wastes to the downstream villages. Instead of getting fresh, natural water from the river they are forced to depend on ground water resources like bore wells or wells. Thus they exposed to effects of hard water and some serious chemicals such as fluorides and arsenic etc. At the same time, it results in decrease in ground water table also. So, the rate of abstraction exceeds rate of recharge, then the drop in water table is noticed. This is what exactly is happening in Bhima basin of Western Maharashtra.

To overcome this scarcity problem the interlinking of river project is attracting government. In this issue we have discussed about pros and cons of the river linking project.

Swami Gyanswaroop Sanand ji is on fast- unto -death for the holy river Ganga. May God give him strength and success in his noble mission. SERI team wishes him best of health!

Thank you,
Chief Editor

Review of River-linking projects in India

- Pallavi Patil

At the end of February 2012, the Indian Supreme Court issued an order to the central government to implement the scheme to interlink rivers of Indian sub-continent in a time-bound manner and appoint a high-powered committee for its planning and implementation. Representatives of various government departments and ministries, as well as experts and social activists will be the members of high level committee to plan out and execute the interlinking of rivers projects.

Interlinking of rivers project means to connect the majority of Himalayan Rivers with peninsular rivers by canals / channels to reduce persistent water scarcity in southern parts of India. This idea was introduced by then Minister for Irrigation K. L. Rao in 1972 to propose a 2640 km long link between the Ganges and Kaveri (Cauvery) rivers. Main aim of this project is to transfer excess water from the Ganga to water deficient areas of South India. Inter-link project would consist of two parts - a northern Himalayan River Development component and a southern Peninsular River Development component.

Long distance inter-basin transfer of water from surplus basins to water deficit basins has been mooted in our country in order to reduce the imbalance in the water availability between various regions.

Some advantages of river-linking projects are that supposedly that they may help in controlling floods in various regions, and making water available at cheaper rates for drinking, irrigation and providing opportunities for generation of hydroelectric power, inland navigation, and employment generation.

River-linking is a thought to be large-scale civil engineering project and technically infeasible and costly. But in India, one common presumption is that there is a huge surplus of water available in river basins, but the real situation is different: most of the river basins are over-used and in many regions it is observed that there is growing tension between different users like rural users, urban users and new industries that all depend on river water.

In these river-linked projects floodwaters are to be channelized, transferring water to the desired area passing through many river basins, but the real fact is that

transferring water would require huge water lifts or tunnels with huge storage facilities. These river-linking projects will also indirectly give support to the construction of high dams which are very expensive as well as time and energy consuming programmes. Construction of large reservoirs/dams has massive environmental impacts like loss of agriculture and forest land, deforestation and soil erosion, and decreasing of biodiversity in that area. Heavy silting of dams reduces their lifespan and water storage capacity, causing enormous sudden discharges leading to highly-destructive flash floods in downstream area, rehabilitation/resettlement of thousands of peoples, and social-economical damage due to forced resettlement of local people etc. These impacts/issues need to be considered in the projects.

Lifting of water is very difficult and impracticable task. For example a 100m-wide, 10m-deep canal that can carry only about 1,500 cumecs is not workable during the Ganga floods because the water flow rate is around 50,000 cumecs on an average.

The environmental impact of these Inter-link scheme projects would be extreme. Transferring of water from one basin to another affects riverine ecosystems, because the water quality of two different rivers have different characteristics which are suitable for specific species of aquatic life. When two different waters of rivers meet, the water quality may change, causing unpredictable problems for the various species found in them.

Also, river-linking affects fish breeding. Means, it affects fish population and ultimately this results into disturbed aquatic food chain. Indisputably surplus water runs into the sea, but diversion of water to many rivers will have a serious impact on the mangroves of the coastal regions and directly on fish stocks that affect precious marine ecosystem. Extra/over irrigation will cause salt levels to rise. These projects also break the hydrologic connectivity between the aquifers, groundwaters and the stream, rivers. This is contributing to shrinking of ground water levels.

This project may develop squabble between neighbouring states or nations due to distribution and utilisation of water during dry and lean period. When these local to regional political issues arise, then it will be potentially converted to critical national or international issues.

Environmental processes, ecosystems, physiography, topography and geography of the country will change forever after implementation of river-linking project, so it is necessary to investigate and document very carefully all environmental, socio-economical, and health impacts of this project before planning for implementation.

If some allocated funds are used for small scale rain water harvesting systems, ground water recharge projects and repairing of existing traditional water systems and making them operational, this will assist to mitigate impacts of dry spell in many regions of India in lesser investment without disturbing/ damaging the existing environmental set up.

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Convergence of Populations For Better Water Resources Management

- Sandeep Joshi

Dynamic mixture of habitats, land uses and livelihood accomplishments of urban, semi-urban, rural (rural-urban) and rural populations in the catchment is the starting point of ecological health of lentic (lakes and ponds) and lotic (streams and river) water bodies. Lake's or stream's ecological health is the reflection of degree of decent culture of urban - rural populations sharing the same water resources banked before or after each other (Stream or Lake Ecological Health - SLEH = Decency of Human Culture - DHC). Leadership or current governance practices failed to make out long term sustainability by maintaining quality of streams and lakes. Now it has scaled up into local to global problems of unavailability, scarcity and pollution.

Severance of the ties of individual and society from water resources in modern world has resulted into lack of basin governance, traditional ownership, relationship and responsibility towards rivers and lakes. Needs + greeds : resources (NGR) ratio has swiftly transformed into a reality of exploding pressures of population on limited resources with attention on use of resources rather than restoration. Now, it is utmost essential for human population to infuse scientific knowledge and technological capabilities for resources management within the multi-faceted social-economic-cultural dynamics of a justly watchful,

conscientious, integrated and down to business civility - which can begin repositioning itself as curator of streams and lakes and their lenticity-loticity!!

Surfacing of pro-environment paradigm by integrating populations with sustainability of ecological health of water resources is necessitating naturally to together address and overcome the ethical-environmental crises emerging out of control and market strategies. These crises are taking a shape of water movements, qualms and sometimes wars in various regions and communities because of deprivation of downstream population by over-abstraction of waters and direct discharge of wastes by upstream population without recognizing or neglecting the natural rights of others including aquatic ecosystems and riparian systems and human beings.

There is now urgent need to converge upstream - downstream populations to preserve, conserve and protect the streams, rivers and lakes and their catchments based on integrated lentic and lotic basin management (ILBM) considering the basic six principles - policy, institutions, information, participation, technology and finances with specific action plans involving maintenance and rebuilding of socio-ecological production landscapes with -

- Exercising the natural, lawful rights of water use by every stakeholder including ecosystem components within the carrying capacity and malleability of the entire catchment of the stream, rivers and lakes
- Responsible and accountable eco-friendly management of waste streams and reuse to protect rights of downstream population to have pollution-free sufficiency of water resources
- Multi-stakeholder participation and collaboration in sustainable and multi-functional management of natural resources and ecosystem services for water quality, food security, poverty reduction, and sustainable livelihood

Convergence of upstream-downstream populations is at different stages of conflict to resolution in most of the lake catchments all over the world where downstream people are woken up to protect their natural rights of clean waters. There are many examples of convergence of upstream-downstream populations on conflicting issues to provide amicable solutions with joint efforts to protect ecological health of the rivers and lakes. The examples include such as Lake Tana, Lake Tanganyika in Africa, Lake Biwa, Japan, Udaisagar Lake, Udaipur, India, Lake Laguna, Philippines, and Ujjani Lake, Pune District, India etc.

Case studies of convergence of the people for a cause of water lead to conclusions that -

- Convergence of communities compels governance to adapt socio-culturally acceptable plans, designs, actions and solutions for sustainable ecological health of rivers and lakes
- Integration of traditional, advanced ecological knowledge and modern science and engineering to encourage innovations for comfort of resources provision without compromising environmental quality
- Discovering, adapting and economising sustainable forms of co-management systems of "commons" and "futures"
- Astuteness to keep safe and sound diverse ecosystem services and values without disturbing ecological equilibrium

Convergence of plans, designs and actions for inter-linking of rivers in north with south means from perennial Himalayan big rivers to rainfed, dry rivers in South India is a challenge of decades because it is not only physical merger or transportation of waters for kilometres but it has multiple long term geo-spatial and eco-time-scale impacts which will change waterscape-landscape of Indian sub-continent profoundly. It cannot be done only on the basis of engineering and economic calculations of GDP increment, increased agricultural production and water to be provided to parched areas of dry parts of India.

This project has immense potential of boosting Indian economy but at the same, it will affect hydrologic cycles of micro-, meso- and mega-watersheds of the country in various degrees. These effects can be estimated on the basis of earlier experiences of river - basin transfers whether it is for drinking water supply or irrigation or hydroelectricity.

We have many examples of inter-basin transfers of waters - especially hydro-electricity projects in Sahyadri mountain ranges in western India. Typical example is of Koyana Dam. The water is diverted to Vashishti river basin to enable to produce electricity. This is actually affecting the water availability in its original basin of Krishna River. Every action in this project is centered on maximization of electricity production and not the mitigation of depravity of water in the Krishna basin.

Secondly, the water released in Vashishti River reaches sea finally without any use or application. Such projects needed to be evaluated on the water economy of the river basins. Then, at the same time restoration and rehabilitation of basin

processes are needed to be taken up to compensate the offsets (ecosystem scale, not in terms of hydrostatic-hydrodynamic quantitative models and relationships) resulted from inter-basin transfers in both - donor and receiver basins.

For massive projects like inter-linking of rivers, the foremost necessity is to establish the interlinked local, regional and national monitoring systems and interpretation systemic mechanisms which will provide time precise information to the well-informed decision - makers. Secondly, it is necessary to keep mitigation technologies and measures within the reach of not only government agencies and institutions for the public at large also. That's why for such massive projects, one has to be very cautious before setting the tone for action. It is not just expression of words or emotions; it should be studied approach to contribute to the wealth and natural heritage of the country.

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One man fights - to Save National Holy River Ganga!!

- SERI Team

Ganga River is the most scared river to Hindus in India. The river rises in the western Himalayas in the Indian state of Uttarakhand. The main six headstreams are Alakananda, Bhagirathi, Nandakini, Mandakini, Dhauliganag and Pindar which all join and to form River Ganga and its outfall into the Bay of Bengal through the former main course of Bhagirathi-Hooghly. The Ganga basin lies in the States of Uttarakhand & Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, West Bengal, Haryana, Himachal Pradesh & the Union Territory of Delhi.

80 year old famous environmentalist Swami Gyanswaroop Sanand, - a retired professor of IIT Kanpur who recently 'embraced sanyas' and took the name 'Swami Gyanswaroop Sanand' - is a member of Ganga Sewa Abhiyanam who have been fighting to protect National Holy River - Ganga - and to stop ongoing and upcoming hydro-power projects on tributaries of River Ganga.

The main demands of the Ganga Sewa Abhiyanam is to completely and immediately stop all hydro-power projects on main the stream of Ganga River, refuse permission to any projects which affect the natural flow of the river in

future and to stop and remove sewage and industrial effluent drainage pipes which drain huge quantities of pollutants into the river.

The main environmental and ecological effects of hydro-power projects on Ganga River are hindrance of the natural flows of rivers, destruction of ecology of the Himalayan belt, etc. The 300 MW Alaknanda-Badrinath hydro project is located in the buffer zone of Nanda Devi Biosphere Reserve. The reserve has two core zones: the Nanda Devi National Park (NP) and Valley of Flowers. Both of the core zones are inscribed as UNESCO World Heritage Site.

Swami ji is sitting on the fast-unto-death. He started the fast on 14th January 2012 and even stopped taking drinking water from 8 March. At middle of March the government forcefully admitted Swami ji into a hospital because of his health condition deteriorating rapidly day-by-day.

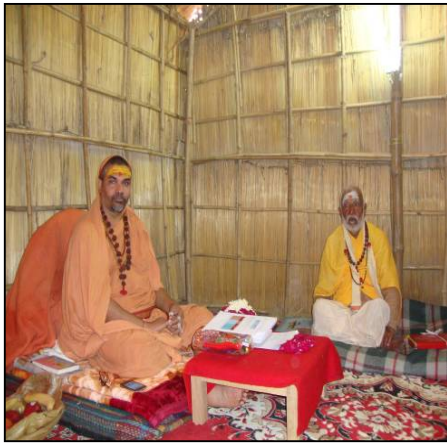
On 23rd March, Swami ji ended his fast after a written agreement and verbal assurances from the central government and meeting had fixed between Prime Minister and members of NGRBA on 17th April 2012.

Swamiji again started his fast because outcome of meeting was not satisfactory.

This is third fast-unto-death of his in the last four years. In 2008, Swami ji sat on fast in order to declare the River Ganga as National River and to develop one authority for its protection. After this developed and Manmohan Singh, Prime Minister of India, declared Ganga as the National River and developed the National Ganga River Basin Authority (NGRBA) for protecting it. They forced the Uttarakhand government to scrap three hydro-power projects on the Bhagirathi - the 381 MW Bhaironghati, the 480 MW Pala Maneri and the under-construction 600 MW Loharinag Pala - and declared a 135-km stretch of the river as eco-sensitive..

Prime Minister of India Manmohan Singh declared on November 4, 2008 the Ganga River would be known as 'India's National River'.

Ganga is not only the Holy River but also it is a symbol of faith, hope and sanity of common peoples.



Swami Avimukteshwaranad Saraswati and Swami Gyanswaroop Sanand ji



Swami Gyanswaroop Sanand ji sat on Fast-unto-death at Magh mela, Sangam, Allahabad UP

Congratulations!!



Mr. Pradnyesh Agre, Environment officer, SERI got felicitated with "ZHEP" award for his work in environment field at Annual Function of Vaishya Vani Samaj (Traders Community), Dombivli held on 18th November 2011, at Auditorium of Pragati College, Dombivli. Audience was comprised of Doctors, engineers and businessmen, academics and various age groups from Community. The award "ZHEP" was given to the young gladiators belongs to Vaishya Vani Community, who successfully works in off-bit fields. While doing work in off bit environment field Pradnyesh has nourished his hobby of photography very well. The cover photo of this SERInews issue is captured by him while working on the eco-restoration of five drains in Allahabad (UP) India. SERI team congratulates him for his success and gives best wishes for his future endeavours. Also express support to his family in this joyous moment..

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Swami Avimukteshwaranad Saraswati and Swami Gyanswaroop Sanand ji visited the Rasoolabad stream comp. project during Magh Mela, Allahabd, UP

