



The purpose of this quarterly digest brought out by the Centre for Ganga River Basin Management and Studies (cGanga) led by the Indian Institute of Technology Kanpur is to disseminate valuable traditional and scientific knowledge assimilated from national and international sources on various aspects of management of water and river restoration and conservation among concerned institutions and citizens.

## TRADITION, SCIENCE, LOGIC AND OUR RIVERS

In Indian culture, rivers are integral to every dimension of human lives. Whether in festive mood or mired in sorrow, humans are invariably drawn to rivers to share their emotions. We take many things from rivers and in turn give them such things like flowers that once used to be the medium to express our love of God. Such activities near rivers now take place on large scales during festivals. But is there any connection of our festivals with the cleanliness of rivers? How relevant are our methods and practices of celebrating festivals in the context of the present condition of rivers? In this issue of Pragyambu we have made an attempt to find answers to these questions.

In the last decade and a half some traditions associated with different festivals were examined vis-a-vis environment conservation. Some rituals caught in the grip of consumerism were found to be unfavourable to the environment. With regard to conservation of environment, particularly rivers, the practice of immersion of idols as part of Ganesh Utsav and Navratri celebrations have been in the limelight because of the negative effects of various ingredients used in making the idols.

Idol immersion has an adverse effect on rivers but this effect is minor in comparison to the major causes of river pollution. But, being conspicuous, these rituals on the banks of rivers get considered as a main cause for river pollution due to which the attention gets

diverted from the real major causes of pollution. In addition, it should be noted that the festivals and their associated rituals such as idol immersion are observed once in a year whereas the problem of river pollution is perennial. Urban domestic and industrial waste are the major causes of river pollution. Discharge of both types of untreated wastewater is the root cause of the problem.

Although the effect of rituals and ceremonies on rivers is less as compared to other major causes, here we would discuss the festivals, their rituals, traditional ceremonies, and the changes they have undergone in modern times because of which they do affect rivers, even if in degree limited way.

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Secondly, by controlling this factor, citizens can set an example and put moral pressure on the administration to take necessary steps in the direction of river conservation.

Immersion of idols into rivers is not the actual problem, instead the various unnatural insoluble substances used in making idols are the real problem. In addition, various chemicals used in the idol's colours, if discharged in large quantities, affect the chemical balance of water bodies. As far as the Ganesh Utsav celebrations are concerned, the general populace has wholeheartedly accepted the various changes introduced for conservation of water bodies. More and more people are making Ganesh idols of clay and immersing them in their homes. In addition, people are also immersing idols in artificial ponds, which are made by district administration for this very purpose so that this act of devotion may not pose any harmful effect on the environment.

Maharashtra and several other states have made efforts in this direction, which have been supported by citizens. Similar efforts have been made in West Bengal, especially Kolkata, with regards to idol immersion at the end of the Navratri festival. Organisers of Durga Puja festivals in Kolkata have gone one step forward in the direction of environment conservation and replaced plates and bowls of plastic by those made of tree leaves. Similarly, at several places, the whole Pandal is made of easily

degradable and hence environment-friendly material.

In an attempt towards conservation of river Tavi in Jammu, similar efforts are made during immersion of "Saankh" (ceremonial materials) during Navratri festival. There is a custom of discharging Sankh in Tavi river at the end of the Navratri festival. Earlier, ceremonial material, clothes and flowers used to be discharged, but slowly materials made of plastic also came into use so that in addition to conventional ceremonial materials, ingredients made of plastic also got discharged into rivers. In order to counter this practice, several citizen organisations came forward and appealed to stop using material made of plastic and also to do the final rituals by discharging ceremonial materials in ponds specially made for this purpose. Devotees readily accepted such efforts. Hopefully, general awareness about conservation of rivers and environment will continue to grow in this manner.

In India, festivals deepen our relationship with the environment. But as a result of the prevalent consumerism, competitive show business and ostentation, several components have entered the ceremonies due to which these traditions are being questioned.

Behind every festival there is a message of conservation of one or the other component of the environment. We attempt to provide a scientific explanation of these traditions and revisit them from a logical perspective. Based on logic and science, we can make an effort to change the perspective not only of Indians but also of international environmental experts towards our traditions. We shall also provide examples of how the environment society were benefitted without denting faith.

Let us start with Ganesh Utsav in which "Durva" (a type of grass), used in the worship of Lord Ganesh, is important not only from a religious perspective but

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also for the environment. Grasslands are important components of water cycle; they maintain soil moisture and are an important link between groundwater and river water. They check soil erosion, help in controlling water flows, and also aid climate mitigation.

Grasslands are very important for ecology and biological systems. Unfortunately this ecosystem has also suffered neglect. Grasslands in the country are diminishing due to several factors such as urban expansion, change in land use and deforestation. Most of us fulfill our religious duties by purchasing Durva grass from market, and also use artificial grass in our homes. We seem to be oblivious to the changes in our nearby forests and grasslands, and don't even display any alertness or promptness to recognise or understand these changes. This ordinary-looking grass is actually the foundation of water resources of our environment.

A reduction in the area of grasslands led to an adverse effect on rivers in China. Several countries now understand the importance of grasslands in water cycle and are striving for their conservation. The Yangtze River (or, "Changjiang" in Chinese), which is the longest river in Asia, is facing problems due to a reduction in the area of grasslands.

Due to this reason, China is continually striving to increase the area of these grasslands. It is important for us to analyse the condition of grasslands on Indian soil and to revive these ecosystems. In India, there are grassland ecosystems in the basins of Ganga, Brahmaputra, Narmada and Cauvery, which fulfill the necessities of local population and nourish local fauna.

In Australia, there were grasslands in the Murray-Darling river basin, which kept on shrinking due to several reasons. The effect of this reduction was seen on the whole basin and the main stem of the river. In fact, the grasslands in Australia were converted to agricultural land because of commercial reasons. In addition, there was over-exploitation of water from rivers for agriculture, which affected the health of the rivers. In view of these changes, the Australian government declared the Murray-Darling basin as an endangered ecosystem in 2012, and started efforts for its conservation. These efforts are still going on and are supported by the agricultural community settled in this basin. These farmers are preserving the grasslands around their farmlands.

If we examine the traditions associated with Ganesh Utsav from a scientific perspective, then we can say that the usage of grass in the ceremony is a message to show us the importance of grass in our lives. After Ganesh Utsav, Navaratri festival and, on conclusion of Navratri, Dussehra is celebrated all over the country. The sighting of the "Neelkanth" bird (Indian blue jay or roller bird) on Dussehra is considered auspicious. In fact, this bird is also important for our whole ecosystem because it survives on insects. Its presence is a proof of sustainable agriculture, which is considered necessary for healthy rivers. But there are fewer sightings of the Neelkanth bird these days. Hence it is appropriate for us now to remember

the lessons of our ancestors and ask ourselves whether the reduced sighting of Neelkanth bird indeed an indication of our diminishing fortune.

Finally, let us talk about the biggest festival of the country — Diwali. Goddess Laxmi is worshipped Diwali and lotus flowers are offered to Her. Lotus is said to flourish in mud. In nature, lotus flowers blossom in rivers, standing water near lakes, slow-flowing rivers, deltas of rivers, ponds, etc. The beautiful lotus plant is a cleanser of our water bodies. It enhances the denitrification of nitrogen reaching the water bodies; this reaction takes place in the vicinity of its roots. In this way, it maintains the balance of nitrogen in water bodies. Not only this, lotus plant absorbs heavy metals like arsenic, cadmium and

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copper present in water, and plays a role in reuse of these elements. Its wide leaves restrict sunlight from penetrating below the water surface, and thus check the growth of algae in water bodies. On this Diwali, try to encourage people

who cultivate lotus because these people are preserving our water bodies and biodiversity in addition to earning their livelihood.

On account of modern development, industrialisation and urbanisation, our

## THIS FESTIVAL, LET US BRING SOME HAPPINESS to THE RIVERS

Our festivals can bring happiness not only to our home and family, but also to rivers and aquatic life, provided we add few more things to the way we celebrate our festivals.

Ganesh Utsav and Durga Puja are two such festivals that involve large gatherings. We appeal to the organisers of cultural and social activities to hold at least one programme focused on a river of the city and organise river-related activities. Such festivals can serve as a platform for forming river management committees, or for introducing the committee members with general public if such committees already exist.

Just as we clean up our homes on Diwali, let us turn our attention to the banks of the river flowing through or nearby our cities. Let us undertake a collective monitoring to check any plastic heap on the banks of this river. Remember that if your nearby river is clean, it will enhance the value of your home, land, farm and garden.

If we offer lamps to rivers on the occasion of Kartik Poornima, let us make sure that the lamps are made of natural substances. A plastic boat with lamp may stay before your eyes for a longer time, but eventually it harms the river and aquatic life.

On the occasions of Kartik Purnima and Makar Sankranti, people take bath in holy rivers in large numbers. On such occasions, it is imperative not to leave clothes or footwear on the banks of the river. Such activities are prohibited in Puranas also. If you want to donate these things, better give them to any organisation or any person in need. Clothes and footwear left on the banks of river do not serve any purpose and eventually transform into garbage.

### INCLUDE IN ANNUAL FUNCTIONS ALSO

During November to January, annual functions will be celebrated in schools and colleges all over the country. Activities related to local rivers can be included in the annual function celebrations of schools and colleges, such as drawing competition for children on the theme 'River of my city', and photography or poetry competition for senior category. There are several songs based on rivers in folk culture but these songs have neither been documented nor archived in digital form. In such scenario, if people from artistic community work on songs based on rivers, then our heritage of folk songs would be saved from extinction.

rivers are facing several problems and challenges. In this scenario, if we keep on discharging unnatural substances into rivers without any understanding of ancient traditions, we would only multiply the problems. Acquisition of knowledge is the only way of resolving these problems. A proper explanation of the concepts of Puranas and their analysis may help us avoid these mistakes in future.

In the traditions of the majority community of India, there is importance of grass at some places and of banyan tree at others. Likewise, in some cases, lotus is important and in other cases hibiscus. Not only such beautiful flowers, but plants and flowers of dhatura are also important. This list is very long. Perhaps these components

of nature were interwoven with our lives from time to time so that we can understand the importance of each component of nature. The future of our natural resources will depend on our present day perspective of these resources and our judicious decisions.

### OLD FLOWERS ARE BRINGING AROMA TO LIFE

Flowers impart joy to humans by their fragrance and colours. However, a startup 'Phool' under the leadership of IIT Kanpur is manufacturing several products from flowers that have already been used in worship and ceremonies. In this way, tonnes of flowers which would otherwise have reached rivers, are instead getting converted into aromatic substances

and reaching markets and homes. The institute takes 8.4 tonnes of used flowers daily from religious sites of Uttar Pradesh. Subsequently, incense sticks, perfumes and packaging materials are produced from these flowers. This whole process provides employment to several local women. The fact that solid waste in such large quantity is stopped before it gets discharged into rivers is the biggest achievement of this project. In the same way, a product that looks very similar to leather is being produced from used flowers.

### EVERY HOME AWAKENED

Rivers and environment are our collective heritage and our collective responsibility. It is possible to monitor collective festivals and traditions, But our daily lives also involve several activities where used materials can neither be kept along with domestic wastes nor stored permanently in the house. One such example is the material used in worship such as flowers and leaves. If we mix these materials in our garden soil, then the fertility of soil will increase and we can use that soil in future while performing any ritual. We can implement this idea in the gardens of single storey houses and in flowerpots in the case of residential apartments.

### AND FINALLY ...

Leo Tolstoy once said that one of the preconditions for happiness is that the relationship between humans and nature should not break down. Festivals represent our happiness, so let us make a collective effort through festivals to strengthen our relationship with the environment. Knowledge and understanding are necessary for a better relationship and harmony between humans, society and environment. We hope that in the radiance of festivals our readers would enhance their knowledge and alertness with regard to the environment.

## River Conservation Described in the Puranas

If the local administration appeals to make modifications in some traditions considering the present condition of rivers, then the general public should not think that any ban or prohibition is being imposed upon them. In fact, the appropriate behaviour in the vicinity of rivers was told by our ancestors several years ago in the Brahmanda Purna. Those lessons are compiled in one shloka which is as follows.

गंगा पुण्यजलां प्राप्य चतुर्दश विवर्जयेत् ।  
शौचमाचमनं केशं निर्माल्यं मलघर्षणम् ।  
गात्रसंवाहनं क्रीडां प्रतिग्रहमथोरतिम् ।  
अन्यतीर्थरतिचैवः अन्यतीर्थ प्रशंसनम् ।  
वस्त्रत्यागमथाघातं सन्तारं च विशेषतः ।।

This verse forbids 14 activities near the Ganga River, which are as follows:

1. Defecation
2. Gargling
3. Washing hair
4. Discharging used material from religious ceremonies into rivers
5. Cleaning of wastes from human bodies by rubbing
6. Discharging human or animal carcasses
7. Indulging in any type of games
8. Accepting donations
9. Disrespectful behaviour
10. Declaring any other place to be better than the banks of a river
11. Comparing any other place with the banks of a river
12. Discarding one's clothes
13. Troubling any creature
14. Making noise or ruckus

Perhaps the word 'Ganga' here implies 'rivers'. If we take care of our rivers in this way, they will always remain clean.

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