



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.

WHY NIRMAL DHARA?

Humans have always been attracted by rivers. Sometimes we worship them as deities and sometimes we play with them like playmates. In fact, in one way or another our lives are centred on rivers and revolve around them. And after spending some time near rivers, we return to our regular lives, forgetting everything about them. Then some day we hear and read about them in news – about various efforts, activities and movements to clean them. But soon we forget such news in the belief that it has no impact on our personal lives. Who cares whether the rivers are clean or not! After all, rivers are merely a source of drinking water, and we have already installed water purifiers in our homes. So why should it matter to us whether the river is clean or not? And as far as the cleaning of rivers is concerned, it is the duty of the government, and the government should fulfill its responsibility.

In Indian culture, there is a profound relationship between rivers and humans. That relationship still exists, but our attitude towards rivers has undergone a change. Our changed attitude towards rivers is similar to that towards many other issues of importance — worship in principle but neglect in action. This is the reason for our callousness towards the state of our rivers — we are not concerned about rivers flowing through our villages becoming extinct,

about rivers flowing through our cities becoming wastewater drains, and about various problems faced by big rivers all over our country. Our concern for rivers simply disappears as we move a few kilometers away from them, and we end up feeling that we have no relationship with rivers at all.

We have built dams on rivers so that our homes and industries can have 24-hour electricity supply. We have divided rivers into canals so that we can maintain stocks of fresh fruits and vegetables in our refrigerators. We have even made the river flow through our pipelines in order to have regular supplies of drinking water. Even after all that, we doubt why we should be bothered about rivers. We still wonder whether we would gain anything by all the efforts towards cleaning rivers. Perhaps you also have such doubts, so let us seek answers to these questions.

An English poem says that people can manage without love in their lives, but no one can survive without water. This is a nice way to express the importance of water. Water is a basic necessity for life, and rivers are the largest medium of bringing water to us. But without flowing water and cleanliness of rivers, one cannot imagine the existence of ecosystems thriving within and outside the waters. At present most people do not take drinking water directly from rivers. However, the most important component of the infrastructure that brings water

to us is river – whether the river be Ganga, Narmada, Kaveri, Godavari, Brahmaputra, or Indus. Whatever water we drink or use for domestic and other purposes is part of a river-system. Even the groundwater used in our cities and towns is part of a river basin.

In the present days of consumerism, people prefer to look for their own benefits in everything. The scenario is no different with conservation of natural resources. But even from the perspective of market economics and benefits, the conservation of river systems will only bring gains. If the river water is clean, then we will get clean drinking water. This will also ensure quality water for our agriculture, which will in turn ensure healthy crops. And that in turn will give us healthy food, good health and better living standards. In this way, with little expenditure we can secure the basic necessities of life.

Today many well-to-do families lay stress on having organic food and food grown by natural methods. They spend more for this purpose simply because they do not want to compromise their health. However, clean water is an even more basic necessity than organic food. Clean rivers will provide clean water for all, and will save us from many health-related problems.

Clean rivers will take us on the path of sustainable development. Urban development in the form of constructing highways, bridges, metro and

multi-storeyed buildings will be of little use if we ignore our rivers in the process.

In addition, clean rivers will secure the existence of plants and herbs growing near the banks, river fishes, and even birds in the sky. In short, if rivers are clean and pure, the world will be pleasant.

Let us now take a detailed look about the cleanliness of rivers.

WHAT IS NIRMAL DHARA?

Nirmal Dhara (meaning “unpolluted water” or, commonly, “clean water”) is related to a river’s natural state. In simple terms, it is the state in which the river water is suitable for the survival and reproduction of organisms that live in rivers. It implies adequate amount of oxygen in the water for aquatic life, and with the proportion of minerals

and salts being appropriate according to the geography, geology and geochemistry of the place. It also implies negligible presence of harmful micro-organisms and minimal possibility of their survival and growth.

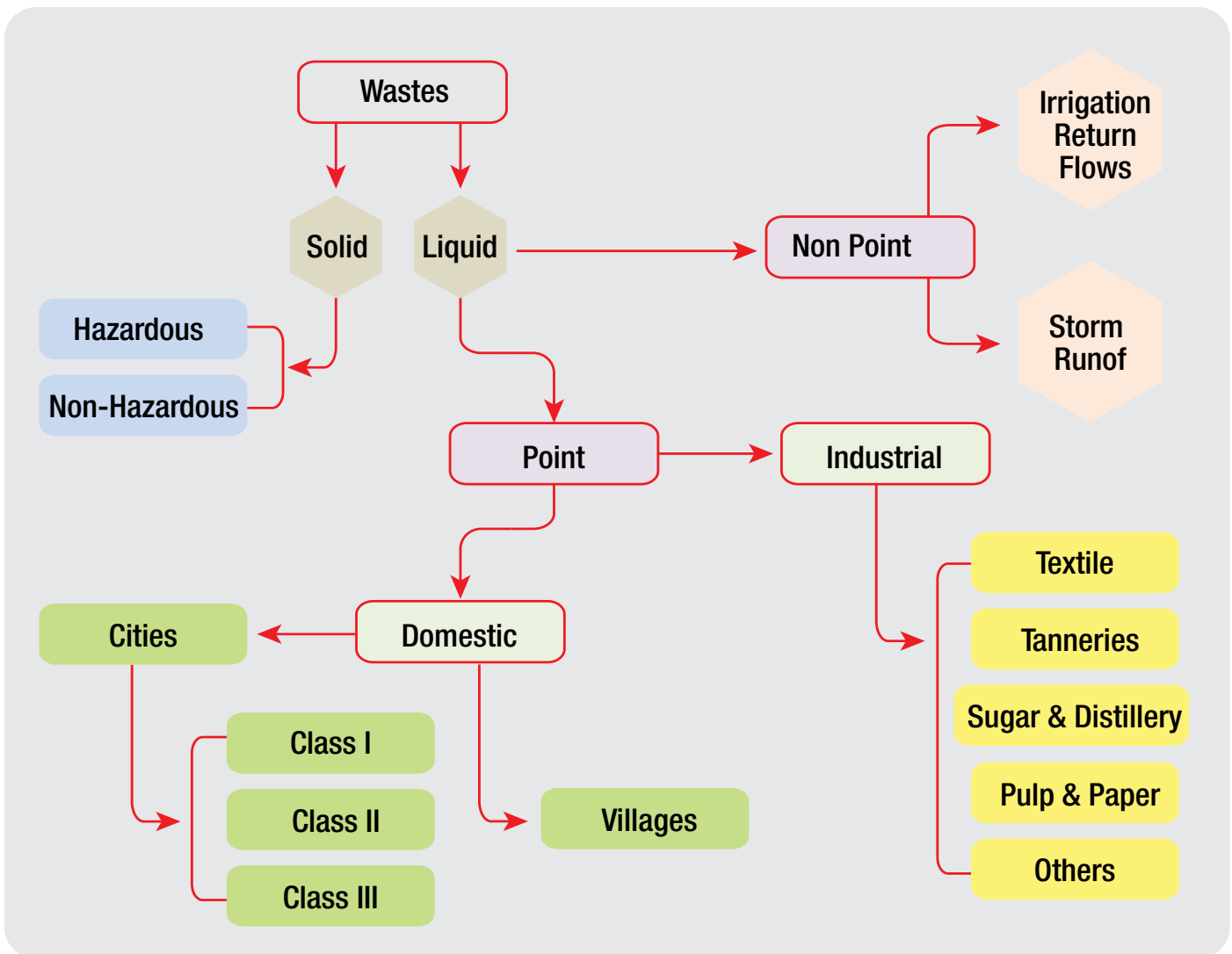
HOW IS NIRMAL DHARA CREATED?

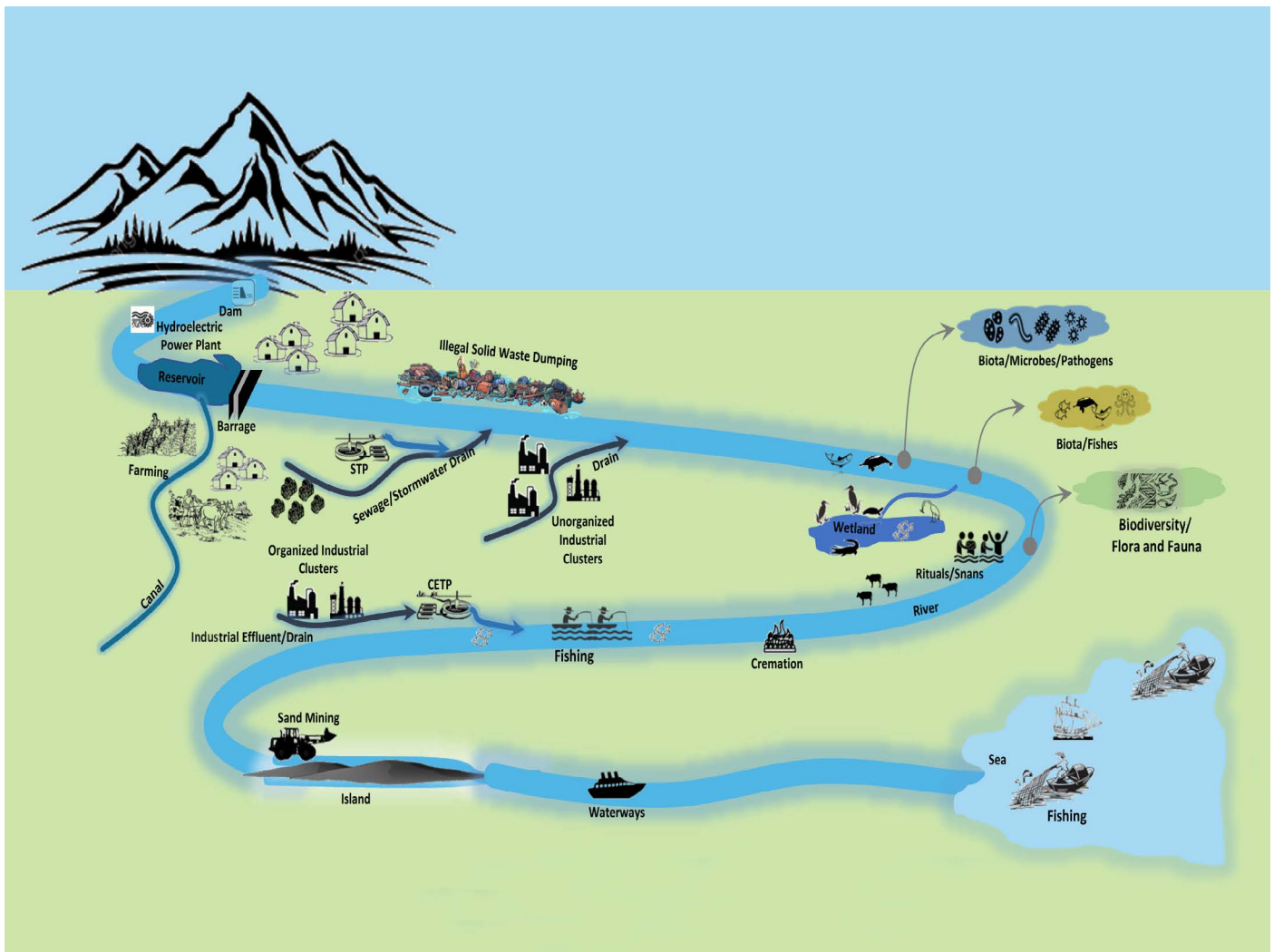
Rivers are capable of keeping their own waters clean. However, this capacity is diminishing in many rivers. In scientific terms, every river has an assimilative capacity. Rivers take care of anthropogenic and other pollutants up to their assimilative capacity. But many rivers receive pollutants exceeding their assimilative capacity, and hence they become polluted. This is the reason that there is an increasing focus worldwide – including in India – on the revival and

revitalisation of rivers instead of just cleaning them. The purpose of such efforts is to restore rivers to their healthy states so that the flow of river water is clean and uninterrupted.

RIVERS DON'T FLOW ONLY FOR HUMANS

A Sanskrit proverb says that rivers flow for the benefit of others. The flow of rivers is truly meant for the welfare of all living beings. We humans seem to think that we have sole ownership over river waters. It is this mindset which has been destructive – first for the rivers, then for the environment, and finally for humans themselves. We must understand that we are not the sole owners of rivers, other living beings also have equal right over them.





HOW DOES NIRMAL DHARA (CLEAN WATER) GET POLLUTED

There are several causes behind the pollution of rivers, some of which are explicit, while others are not so evident. The causes of pollution which are explicit are called as 'point sources' in technical terms, while those which are not evident are called 'non-point sources'. One can understand the process of pollution of rivers from the adjacent figures.

Mixing of urban wastes and industrial wastes in river waters is the biggest obstacle to the cleanliness of rivers. While industrial wastes are responsible for contamination of rivers by various chemical elements, wastewater discharged from cities brings large amounts of harmful germs as well as various organic and inorganic pollutants to river water. With time, the amount of pollutants becomes greater than the assimilative capacity of the river.

NOT JUST A STREAM

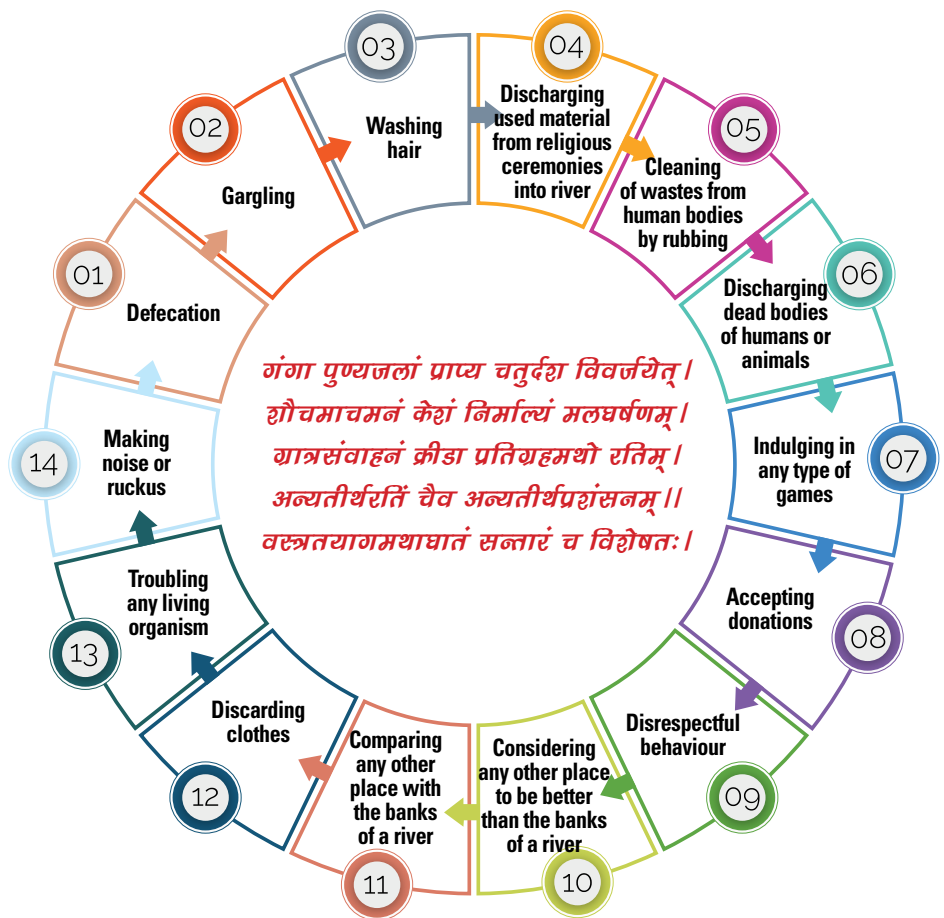
Generally, by the term 'river' we understand the main stem of a river. This is true from a cultural and administrative perspective; however, from a scientific perspective, a river is a system and not just a stream. It is a system made up of the main stem and its tributaries. If polluted water finds its way to any of the streams of this system, then the main river also gets polluted. In the last three decades, there have been large scale expansion and development of cities in our country at the price of deforestation and exploitation of our natural resources. We might have made rapid progress in the direction of development but failed to figure out a way to managing the polluted effluents from the urban centers. Sewage generation has kept on increasing every year and the quality of river waters has kept on deteriorating. One of the main reasons behind pollution of rivers is untreated sewage. Due to this sewage, the presence of coliform bacteria in Ganga had increased 1000 times the permissible limits prior to the initiation of river cleanup programmes.

In addition, the wastes accumulated on riverbanks from various discharges and open defecation flows into river water with rainwater runoff. Pesticides and fertilisers used in agriculture also flow into river water in this way. In India, religious faith is associated with rivers; however, even our religious ceremonies and rituals have been affected by consumerism. Lately, a good many synthetic and unnatural items are being used in worship, which are discharged into river water after worshipping. The discharge of such artificial material used for worship, such as plastic lamps and plastic carry-bags containing flowers, as well as human and animal carcasses affect the cleanliness of rivers.

ANCIENT WISDOM SHOWS THE SOLUTION

The administration is taking measures at its level to ensure clean rivers. Efforts are being made based on scientific and technological knowledge. The solution to ensure clean and pure river water was shown by our ancestors several thousand years ago. For example, the Brahmanda Puran tells us about the proper behaviour in the vicinity of rivers. Those lessons are compiled in the following verse:

This verse forbids 14 activities on the banks of a river:



I am a river, I want to say something...

I am the river that flows through your village, the same river that you watched eagerly on your way to school, the same river whose fish and other animals fascinated you so much, whose bank vegetation was ever useful to you – and I am the same river over which passing trains would scare you. You call me “Mother” and come close to me, which makes me very happy. But, you know, I am also hurt by some of your habits like these:

- When you chat amongst yourselves and call me a dirty drain I get hurt, because I am not a drain but a river. My name is not in your schoolbooks, but, of course, I have a name which your grandfather would remember. I don't flow long distances like big rivers but, eventually, I become part of the same big river that you worship.
- When you encroach upon my banks, I begin to suffocate, because just as you need fresh air to breathe and live I need rainwater and soils to flow into me freely, which doesn't happen unless you build your constructions a good distance away from my banks.
- When you litter my shores, I am aghast! Am I the place to dump your rubbish?
Nowadays, on festivals, people offer me “*bindi*”s, bangles, lipsticks, and what not. I smile at their innocence, but my real makeup consists of the vegetation and forests and their flowers near my banks and all around me. The glow of the sun itself adorns me. I love it when you approach me, but please give all your surplus stuff only to those who need it.

The activities which were forbidden on individual level in the above verse later became collective activities indirectly as the sewage from cities started flowing through different pathways to rivers. The aforementioned verse was originally written on the river Ganga; however, spirit of Ganga is for all rivers as well.

To restore Ganga and other rivers to their original states we need to follow the instructions given in the aforementioned verse. Human activities produce several types of waste products which reach our rivers on account of defective waste management practices and lack of correct knowledge. However, it is possible to rectify this problem. In the forthcoming issues we will discuss what should be done to clean the rivers and the various activities that are being carried out.

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