

Pollution from Non-Point Sources in Ganga Basin: A Community-based Potential for Managing the Unmarked Crisis

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Introduction

In 1979, Prime Minister Indira Gandhi entrusted Dr. Niloy Chaudhuri, the then Chairman of the Central Pollution Control Board, to carry out a comprehensive survey of the entire stretch of the river Ganga to find out the pollution load and from where it reaches the river. The survey held municipalities as the main source of pollution (about 70%), followed by the industries which drain their untreated sewage into the river. These were termed as point source pollution, which is to mean that the polluter can be apprehended straight away by assessing its discharge quality through the effluent points. However, pollution from the vast agricultural fields, in the form of agro-chemical wash which invariably creep into the flowing river, was deliberately avoided as a mark of pragmatism. It is much too difficult to chase pollution from non-point sources. It was assumed, that considerable success will be achieved by reducing the point source pollution along the course of the river. Ganga Action Plan (GAP) was launched in 1985. That was Phase- I of the Asia's premier river cleaning initiative. That it did not work out well is a matter extensively deliberated in the public domain. Subsequently, Phase- II started with renewed hope. But even in this phase, the problem of soil pollution that is the problem of pollution from non-point sources, has remained outside the remit of the grand plan. Since 1985, twenty five years have seen manifold multiplication of soil pollutants being added to the flow of water both above and underground, most of which rapidly or slowly reach the river. In the present communiqué, the pragmatism of 'strategic omission' regarding soil pollution, i.e. non-point source pollution, is seriously questioned. The

possibility of an agenda related to reducing soil pollution has also been briefly discussed.

Ganga Action Plan – a rapid update

On 10th June 2010, the Cabinet Committee on Economic Affairs, on the basis of a report submitted by seven IITs (Kanpur, Mumbai, Kharagpur, Delhi, Guwahati, Chennai and Roorkee) asked them to prepare a work plan for National Ganga River Basin Authority (NGRBA). The committee on the same day also approved a proposal for carrying out a plan worth Rs. 496.90 crore (with Japanese assistance) at Varanasi. Earlier, on 3rd October, 2009 Prime Minister Manmohan Singh announced that the World Bank has agreed in principle to make available US\$ 1 billion for the purpose of cleaning the Ganga. A total of Rs 15,000 crores will be spent over the next 10 years to make the Ganga River pollution free. GAP Phase- I was declared closed in March 2000. In Phase-I sewage treatment capacity of 865 mld was created, although even an optimistic assessment will not assure 50% utilisation of this created capacity. GAP Phase-II included within its fold the plans for rivers Yamuna, Gomti, Damodar and Mahanadi in various stages from 1993. None of these schemes however, addressed the problem of non-point source pollution within the Ganga Basin.

In an interview with Madhusudan Srinivas (July-August 2003)¹ K. C. Sivaramakrishnan, Former Director of the Ganga Action Plan, said that there were **three**

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http://www.cleanganga.com/articles/july03/ganga_survive.php

essential factors that planners had to bear in mind.

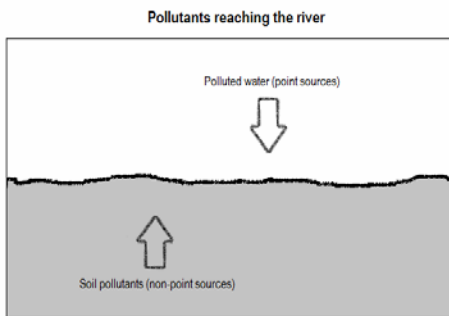
First of all, while technology is a key issue, not all technologies are equal to the job of cleaning up, if people continue to remain dirty and filthy. Social awareness was and even now, remains the greatest challenge.

"Secondly, we had not paid attention to **non-biological, chemical pollution**. That's valid not only for the Ganga, but also for all the rivers of the country. **Most rivers the world over have become aquatically dead - because mankind did not pay attention to fertiliser residues, to insecticides and chemicals.** (emphasis author's) The self-cleaning properties of Ganga arise from the biological resources in that river. And chemical pollution has the capacity to slowly destroy those properties. Once that happens, the river cannot recover. That is what has also happened to some rivers in the Western world.

"The third point - we are still not paying attention to the river as a continuing, dynamic ecology. As a society, we've still not accepted that a river is an ecological being. It must have a 'minimum flow', or a minimum amount of water flowing in order to dilute and dissolve pollutants. When water is diverted into an irrigation canal, there is less fresh water to dilute pollutants".

The present author shares the anxiety with K. C. Sivaramakrishnan relating to the killing effect of agro-chemicals on riverine ecosystems.

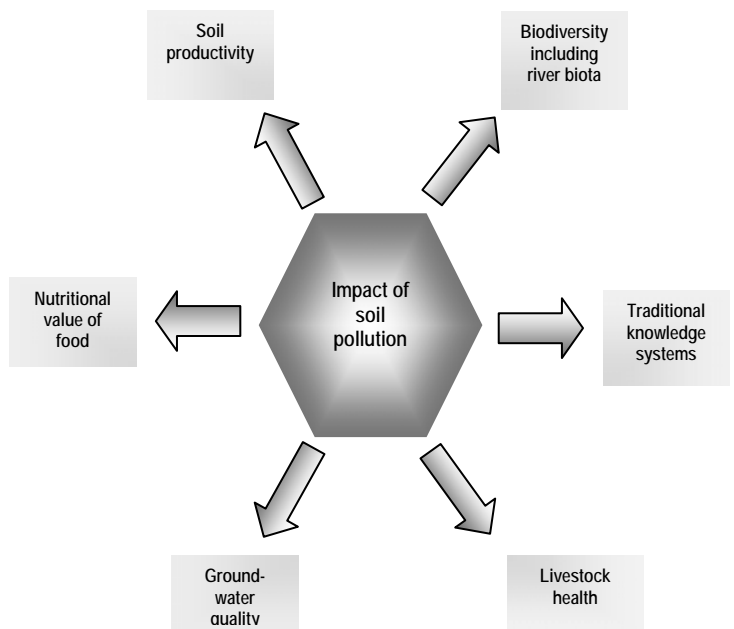
Pollution from non-point sources



All these years the countryside throughout the Ganga Basin has lost a large share of biodiversity stock and the quality of its soil has become unfriendly to plant growth. In fact, imprints of biodiversity loss in the countryside are ubiquitous. A few decades ago, paddy fields used to grow large quantities of small fish which was the basic protein supply of the rural people, particularly the children. These fish do not grow anymore because of the pesticides being applied. Speak with any elderly villager and she will tell you about the dwindling bird species, many tree species, frogs and such others. Frogs used to eat up at least 20 per cent of the insects in the agricultural fields.

Major damages created by intense misuse of agro-chemicals will include soil productivity loss, loss of biodiversity including river biota, loss of traditional knowledge systems, loss of livestock health, loss of groundwater quality, loss of nutritional value of food and so on. What however is not easily visible is the loss of biological life of the river which in turn drastically reduces its self-purification property, for which the Ganga is rated to be most outstanding. The following diagram attempts to comprehend the major effects from agriculture and soil pollution.

SIX DAMAGES TO THE BASIN ECOSYSTEMS



Pollution free Ganga will be a Utopia unless the problem of non-point source pollution is taken up immediately. The present communique puts this problem across and proposes a direction to meet this unmarked challenge. This matter brooks no further delay.



The situation, in fact, is showing more tangible signs of fatigue. Only recently it has been reported that thousands of tonnes of Indian basmati rice exported to European countries have been rejected in the last few months after excessive pesticide residues were reported by a private laboratory. Indian traders withdrew about 30,000 tonnes from various chains of stores in Germany alone to avoid punitive action². This rice is likely to come back to India and lesser mortals like us will consume the entire stock happily without even knowing it. After all, every day we are consuming vegetables knowing fully that some of them were sprayed with pesticides just on the previous night. Somewhere, some day, we have to get rid of this *lesser mortal* tag which we indeed carry with whatever grace it may be.

Developing the idea of Rural Landscape Management

The idea is to introduce rural landscape management agenda for reducing the non-point pollution load in the Ganga Basin. A rural landscape is a visual cultural image of

² The Times of India, 4 October 2010

whichever ways the villagers act upon it. Landscape is a place where every villager can participate with his/ her contribution. The landscape management action plan can trigger change in social and cultural institutions for the conservation and wise use of ecosystems. The idea is to generate a rural landscape management plan by the villagers and implement that through the decentralised institution of rural governance. The powers and authority conferred by the 73rd Amendment of the Indian Constitution has provision enough for every village to have its own landscape management plan. The content of the management plan will have location-specific initiatives.

The idea of rural landscape management for handling non-point source pollution or soil pollution is uncommon in the Indian countryside. However, Europe has started this practice since long for conserving biodiversity and visual pleasantness, as well as reducing soil pollution (Idda et al, 2005). Recently, a near similar agenda based on landscape has been developed in the east. This is known as the Satoyama Initiative.

This is a landscape-based programme introduced essentially for the conservation of biodiversity, but is as much an inclusive agenda. Satoyama Initiative has an overall objective to promote and support *socio-ecological production landscape, to maintain their contribution to human well-being and objectives of the Convention on Biological Diversity* (this is a part of the Paris Declaration on Satoyama Initiative, 29-30 January 2010. The Ministry of the Environment of Japan and the United Nations University Institute of Advanced Studies (UNU-IAS) jointly initiated the Satoyama Initiative.

Comparing the paradigms

The two paradigms of sewage treatment plant (STP) and rural landscape management (RLM) are completely different. STPs are structural solutions, a construction work to be more precise, whereas rural landscape

management is a non-structural community-based approach. STPs are supposed to act only after the pollutant is released whereas rural landscape management approach will attempt to restrict the release of pollutant at

source. STPs are energy hungry and cost intensive whereas rural landscape management needs neither energy nor a lot of money.

Details of the difference between two systems are better exemplified in the following table:

Pollution Control (point and non-point)

| Paradigm | Sewage Treatment Plants | Rural Landscape Management |
|------------------|--|---|
| Primary purpose | Reducing water pollution | Reducing soil pollution |
| Strategy | Command and control | Voluntary, incentive based |
| Design | Mainly structural | Mainly non-structural |
| Monitoring | Specialised, equipment based | Participatory, less specialised |
| Uniqueness | Textbook technology | Location specific, flexible, diverse and innovative |
| Approach | Actions are taken after the release of pollutants | Actions are taken before the release of pollutants |
| Governance | Centralised | De-centralised, participatory |
| Cost involvement | Cost- intensive | Low cost |
| Reliability | Inconsistent, feeble | Yet to be tested |
| Type of the unit | Enclosed | Open, basin wide |
| Climate impact | Energy intensive | No additional energy requirement, prospect of better carbon sequestration |
| Technology | Bio-chemical reactor | Ecosystem manipulation |
| Depreciation | Usual depreciation for plants and equipments | None, prospect of constant value appreciation |

Informal initiative

As a part of a separate ecosystem development project the prospect of developing a landscape management plan and its implementation was examined in one Gram Panchayat in Purulia district of West Bengal. In course of one year three formal meetings with the Gram Panchayat members, one workshop and a number of informal group discussions were carried out.

The villagers and Panchayat members generally agreed that:

- 1) there should be acceptable guidelines for managing the landscape features of the village
- 2) villagers are worried about the decreasing biodiversity, paddy fields no more growing fishes, extensive use of pesticides and shall cooperate if better agricultural options are made available to them
- 3) they are ready to appropriate and learn from the Santhal community who are outstanding in built-form architecture, neighbourhood planning and maintenance, preserving forest resources and such other outstanding knowledge in natural resource management

On the lee ward side of the experiment, it was not clearly visible how much the village people are spontaneously willing or how good are their relations with the Panchayat functionaries. They did not seem to share the same wavelength when we were not present. Nevertheless, these are matters to address cautiously but not so much as to upset the programme. The basic advantage of discussing landscape management with the villagers is that they are naturally capable to discuss a holistic agenda where they find most of their activities reflected.

Setting postulates for research and action

It is useful to begin an overarching programme like this with a set of postulates which can get examined during the process of

implementation of the agenda and related research. The postulates are the following:

Pollution from non-point sources

1. If we cannot reduce agro-chemical inputs on our agricultural fields reasonably quickly we are set to lose our water and soil health irreversibly. Biological life including that of humans is on its last legs.
2. Information about the impact of non-point source pollution is meagre. Taking decisions on land and water therefore will incorporate precautionary principle in place of any exercise in pretentious optimisation.

Ecosystem Management

3. As the people deserve healthy river water so also do the farmers who deserve a good soil health. These two goals of ecosystem health are interconnected and indivisible.
4. The culture of conserving natural ecosystems has been found to thrive among the poor. In many cases roots of such management knowledge are to be found in its ecological history. Traditional practice and wisdom conceal many effective and useful key to sustainable management of natural resources. However, not all such practices are good and some of them can be undesirable.

Politics

5. All public decisions are political decisions and are increasingly becoming business decisions.
6. A good part of top down environmentalism can be *sponsored*, occasionally opportunistic in nature and sometimes lacking scientific reason.

Societal

7. Ecosystems in most cases will have conflicting uses and interests and any change contemplated may not be universally good to all the contending

interests. Therefore the designer will have to take side.

8. Abuse of Nature and natural resource systems will invariably have its social, economic and environmental backlash. However, such reactions are not instant and this time lag provides opportunity to the manipulators and speculators to inflict permanent damage to our ecosystems by forcing improper land use change on the society.

Conclusion

As of now we have a rich experience of a 'not so successful' initiative in cleaning the river Ganga. Raising questions should still therefore be accommodated in redesigning the basics. It has been stated earlier that the issue of reducing soil pollution reaching the river was sidelined in 1985 as a mark of pragmatism. Today in 2010, *the strategic omission* of yesteryears may not continue to be pragmatic anymore. It is imperative now to factor in the problem of non-point sources within the fold of Ganga Action Plan or for that matter any river action plan.

In Europe, a number of countries, have introduced rural landscape management and in some cases legislated on the same to address the problem of soil pollution along with a promise to preserve and enhance the visual-cultural excellence of the countryside.

In India, the advantage with rural landscape management initiative is that we have an institution already in place in the form of Panchayati Raj system. The 73rd Amendment of the Constitution has enough strength to allow every single village to have their own

landscape management action plan in place. Essentially, villagers will need knowledge support for some time and thereafter they are likely to continue the programme mostly by themselves. Simple studies can be taken up to assess the cost involved to implement this project over a region, although it can be safely said that the cost involvement will be reasonably low.

Over 400 million people, a large portion of them being rural, live within this most populous river basin of the world. It may be in the fitness of things that they are also included in an agenda for reducing the pollution load that most of them, as farmers, continue to add daily upon the vast agricultural fields and spoil the quality of life for everyone, themselves included.

Rural landscape management is one such option that encourages the participation of every well meaning villager/ farmer of our country. As polluters they may not pay because they have been trapped into a vicious cycle of adding more and more chemicals to maintain the previous year's production level. But they should come forward to be partners in management plans to reduce the pollution they are unavoidably and increasingly adding on a continuous basis. Millions of basin inhabitants are being slowly poisoned.

This communiqué is not about removing doubt about the fact that soil pollutants reach the streams and the stream ecosystem is irreversibly damaged. It is about developing an instrument to reduce the pollutant load from agricultural fields with the help of rural landscape management.

Text of the invited lecture at the workshop on 'Community Development in the Ganga Basin in Response to Climate Change' held in Kolkata on 22-23 September 2010 at the behest of Monash Sustainability Institute, Australia and Institute of Development Studies, Kolkata

References:

http://www.cleanganga.com/articles/july03/ganga_survive.php

Idda Lorenzo, Madau Fabio A., Orrù Elia, Pulina Pietro and Sini, Paola, M. (2005). "Efficacy of European Policies on Rural Landscape: The Case Study of Sardinia (Italy)", Copenhagen, Denmark.

The Times of India, 4 October 2010