



Environment

Water Community



Disaster Management Community

Solution Exchange for the Water Community

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Consolidated Reply

Query: Flood Induced Water Conflicts - Experiences

Compiled by [Nitya Jacob](#) and [G. Padmanabhan](#), Resource Person and [Nupur Arora](#), Research Associate

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From [K. J. Joy, Suhas Paranjape and Shruti Vispute](#), Forum for Policy Dialogue on Water Conflicts in India, Pune

Posted 16 September 2008

We work with the Society for Promoting Participative Ecosystem Management (SOPPECOM). We have been part of the Forum for Policy Dialogue on Water Conflicts in India which is a collaborative initiative of many institutions/organizations – both academic and civil society – and individuals. The Forum has documented conflicts and published these in the form of a book “Water Conflicts in India: A Million Revolts in the Making” (more details about the forum are available at <http://conflicts.indiawaterportal.org>).

The current floods in Bihar have seen conflicts over scarce resources at many levels, including between India and Nepal. This is not the first time floods have provoked conflicts (more details are available at <http://www.solutionexchange-un.net.in/environment/resource/res15090801.doc> (doc, Size: 33 KB).

The issues of conflicts and floods have been discussed earlier on the Water Community. Members responded very enthusiastically to a recent query concerning the floods in Bihar, dealing with water purification techniques and the Bihar floods. The consolidated reply is available at <http://www.solutionexchange-un.net.in/drm/cr/cr-se-drm-wes-01090801-fullcr.pdf> (PDF, Size: 367 KB). In 2005, a query on water conflicts between rural and urban areas and competing water claims and conflicts also drew a good response. The Consolidated Reply is available at <http://www.solutionexchange-un.net.in/environment/cr/cr-se-wes-global-18120501.htm>.

We request members to share their experiences and insights on the issue of conflicts around floods, specifically on:

- In what are the cases have floods provoked conflicts. Please give details of the location, the reasons (including the very simple, obvious, proximate to more complex and long term reasons), conflicting parties, issues at stake, what has been done to mitigate, present status, etc.?
 - What is the definition of “stakeholders” in each conflict situation, including the specific roles for each?
 - We would also like members to share cases of successful resolution or mitigation of conflicts, so we can use them as lessons to incorporate as part of the wider strategy for resolution and prevention.
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Responses were received, with thanks, from

1. [Himanshu Thakkar](#), South Asia Network on Dams, Rivers and People, New Delhi
2. [Prashant Hedao](#), L'avenir d'Auroville (Auroville Planning and Development Group), Auroville
3. Nitya Jacob, The United Nations Children's Fund, New Delhi ([Response 1](#); [Response 2](#))
4. [B. L. Kaul](#), Society for Popularization of Science and Progressive Educational Society, Jammu ([Response 1](#); [Response 2](#))
5. [N. Sashikumar](#), National Institute of Advanced Studies, Bangalore
6. [Abhishek Mendiratta](#), Consultant, New Delhi
7. [Asha Ramesh](#), Wateraid, New Delhi
8. [B. S. Bhavanishankar](#), Sahayoga, Bangalore
9. [Sudhirendra Sharma](#), The Ecological Foundation, New Delhi
10. [Praveen Srivastava](#) Tranzlease, Pune
11. [Binayak Das](#), Arghyam, Bangalore
12. [Shalini Jain](#), SEEDS, New Delhi
13. [Pranab R. Choudhury](#), Independent, Bhubaneswar
14. [Benita Sarah Mathew](#), Social Performance Management Unit (Research), ESAF, Kerala
15. [Neelima Garg](#), Uttarakhand Jal Sansthan, Dehradun

Further contributions are welcome!

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Summary of Responses

The query evoked insightful responses from members on the conflicts arising because of the current floods in Bihar. Discussing the issue in depth, respondents looked at the causes of water conflicts and offered suggestions for long-term measures to prevent them.

Discussants stated that **the current floods** are due to poor maintenance of the Kosi River's upstream embankments in Nepal, which is the [Ganga Flood Control Commission's](#) responsibility. The floods have seen conflicts, between the affected communities and authorities, between those living inside and outside the embankments, and between those who have received food aid and those who have not.

Members pointed out there are around 1.5 million people living within the embankments of the river, who face floods annually. This year the river burst its banks and the waters inundated land outside the embankments, affecting around 3 million people. While the current floods have underscored the tensions between the two groups, respondents noted there have been fights over the embankments since 1963, when the authorities built the embankment.

Discussing the flood situation in [Orissa](#), members said people in the state cope with annual floods and highlighted that embankments, dam and reservoir operations, draining congestion and silting of riverbeds are major causes of the annual floods. These problems pit flood-affected people against the government, and the people living in the upper catchment areas against those downstream, and both groups dealing corruption within the system. Additionally, there are often fights between neighbouring villagers over breaches in the embankments.

Citing the situation in [Surat, Gujarat](#) in 2006 and similar cases where floods occurred because of excessive water discharge from dams or upstream watershed projects, members explained that while these interventions are meant to resolve or reduce conflicts, they seldom take into the account the root cause of the conflict.

Similarly, floods have triggered inter-state conflicts, such as those between Tamil Nadu and Karnataka, and Karnataka and Andhra Pradesh who blame Maharashtra for uncontrolled flooding. Therefore, discussants urged the government to identify causes, diagnose the dynamics and assign responsibility during discussions intended to build 'hydro-solidarity' between states.

In the current case of Bihar, members mentioned that how flood-affected communities clashed with the Railway Protection Force as they were trying to dig up the railway tracks to drain floodwaters. At the international level, India is blaming Nepal for not allowing it to repair the embankments, while Nepal has stated the Indo-Nepal treaty of 1954 is a 'historical blunder,' and both countries have accused each other of laxity in maintaining the embankments. India wants to construct dams in Nepal to control the flooding from the Kosi and other rivers, but Nepal short of agricultural land oppose this idea.

Respondents highlighted that the situation in Bihar is not unique; floods on the Indian sub-continent have also led to conflicts with other countries. For example, Bangladesh holds India responsible for recurrent floods, as it does not control the Ganga and Brahmaputra rivers.

Looking at the **issue of stakeholders**, discussants identified various categories. In the Bihar case, they classified stakeholders into two levels 1) the household (micro) level and 2) the macro (state) level. Water users such as women, farmers, panchayats, and district-level local government bodies are one set of stakeholders. Flood control departments, the Railway Protection Force, and local, state and national governments are another set.

Given that the existing floods and conflicts are due to the failure of the embankments, members suggested specific roles for each group. Governments at the national and state level need to review the policy on construction of embankments as a flood control measure.

In addition, members made **several suggestions**, which could be incorporated as part of a wider strategy for resolution and prevention of conflicts. They recommended identifying the causes of conflict and then seeking to address them. In the case of the Kosi River, institutions need to be held responsible for the current state of affairs, before implementing any new approach.

Respondents also felt that flood control and flood-management efforts often generate conflicts, rather than the floods themselves, and thus suggested a phased programme to dismantle the embankments as a long-term solution to the floods and the conflicts between different stakeholders and the authorities. In the current context, members suggested the authorities work on protecting embankments and paying compensation to those affected.

Another idea mentioned was to adopt a strategy called 'room for the river,' which is used in Europe to prevent conflicts between stakeholder on the rivers Rhine and Meuse.

Discussants also stressed women, being the most vulnerable in any conflict situation, have to be part of any flood/conflict resolution mechanism. This will help in providing a wider platform for preparedness and redevelopment. Moreover, they highlighted the need for better understanding between India, Nepal, Bangladesh and China to stave off emerging conflicts over river management.

Finally, members discussed the history of embankments in India. They pointed out the British did not construct embankments on the Kosi River because they realized it would result in rapid siltation of the riverbed, necessitating higher embankments (to which there is a limit). Looking at the possibility of destroying the embankments, respondents said there is a precedence of embankment demolition in India. For example, in 1869 the British demolished the embankments on the river Damodar built in 1854, because the embankments were submerging fertile lands and in 1896 the first-ever compensation of Rs 60,000 on account of submergence due to embankment failure was given to a farmer Burdwan district of West Bengal.

Comparative Experiences

Orissa

2008 Floods Generate Conflicts, Cuttack, Jagatsinghpur, Kendrapara and Puri (from [Pranab R. Choudhury](#), *Independent, Bhubaneswar*)

Orissa is facing its worst floods since 2001 in four coastal districts, because of excessive discharge from the Hirakud dam on the Mahanadi river. The flooding has highlighted the tension between the local communities in these districts and the authorities. The state government's Orissa Disaster Rapid Action Force and the district administration have rescued people stranded by the floods, and are working on mitigating the effects of the floods and the resulting tensions.

Gujarat

Promote Action Saved Lives During 2006 Floods, Surat (from [Sudhirendar Sharma](#), *Ecological Foundation, New Delhi*)

In 2006, heavy water releases from the Ukai dam on the river Tapi, resulted in major flooding. The state government reacted promptly and was able to rescue people from the floods, by calling in the army for assistance. As a result, the state government, along with the district administration, were able to evacuate more than 30,000 people from the city's low-lying areas.

West Bengal

Recommendations on How to Prevent Flooding in Ganga-Brahmaputra-Meghana Basin, Kolkata (from [B. S. Bhavanishankar](#), *Sahayoga, Bangalore*)

During the August 2008 workshop on "Flood Study in Ganga-Brahmaputra-Meghana Basin in India," recommendations were made. Specifically, participants advised the Indian government engage in long term planning with regards to the Basin to prevent flooding and water conflicts. They identified the root causes that need to be discussed in the future to refine the exact plans. As a next step, they suggested donors support Nepal, India and Bangladesh in the implementation of their various plans. Read [more](#)

Related Resources

Recommended Documentation

From [Himanshu Thakkar](#), *South Asia Network on Dams, Rivers & People, New Delhi*

Kosi's Tragedy: Blunder after Blunder

Article; by Himanshu Thakkar; South Asia Networks on Dams, Rivers and People; 1 September 2008
Available at <http://www.rediff.com//news/2008/sep/01guest.htm>

Talks how Kosi flood is a completely was entirely due to neglect of the embankment on Nepal side and the confusion on who's responsibility was it to maintain the dam

Trapped! Between the Devil and Deep Waters: The Story of Bihar's Kosi River

Book; by Dr. D. K. Mishra; South Asia Network on Dams, Rivers and People and Peoples Science Institute; New Delhi; 2008

For copies send a Cheque (only in New Delhi) or Demand Draft in favour of "Dams, Rivers and People payable at Delhi to SANDRP," c/o 86-D, AD Block, Shalimar Bagh, New Delhi 110088; Tel: 91-11-2748 4655; ht.sandrp@gmail.com

Book explores the issue of water conflicts that have arisen due to the Kosi river flood in Bihar.

Dui Paatan Ke Beech Mein (Between The Devil and The Deep River) (from [Prashant Hedao](#), *L'avenir d'Auroville (Auroville Planning & Development Group), Auroville and Nitya Jacob, UNICEF, New Delhi; response 1*)

Documentary Film; by Arvind Sinha; 1997 (in Hindi)

Available at http://www.cmsindia.org/vatavaran/the_festival/water/11.htm

Sixty-five minute film shot in northern Bihar that looks at the development project have destroyed the livelihoods of people and also explores the problem recurrent floods

From [B. S. Bhavanishankar](#), Sahayoga, Bangalore

A Workshop on "Flood Study in Ganga-Brahmaputra-Meghana Basin"

Report; CEMPD, Kolkata and Sahayoga, Bangalore; 2008

Available at <http://www.solutionexchange-un.net.in/environment/cr/res16090802.doc> (Doc Size: 87 KB)

Proceedings of a workshop on the issue of international conflicts over floods, discusses at length what causes conflicts due to floods, like the in the case of the Kosi river flood in Bihar

India Water Partnership- Study on Floods in India

Report; by Mr. B. Bhavanishankar; Sahayoga; Bangalore; July 2008

Available at <http://www.solutionexchange-un.net.in/environment/cr/res16090801.doc> (Doc Size: Size: 90 KB)

Discusses how to support the management of recurrent floods in Nepal, Bhutan, India and Bangladesh, and looks at the current flood situation and suggests solutions for India

Recommended Organizations and Programmes

Sahayoga, Bangalore (from [B. S. Bhavanishankar](#))

5th Block, Jayanagar, Bangalore 560041 Karnataka; Tel: 91-80-6636616;

<http://www.angelfire.com/ak/sahayoga>

Works on issues relating to international conflicts over water, which stem from floods, and in August 2008 conducted a workshop on water conflicts.

Ganga Flood Control Commission, Patna (from Nitya Jacob, UNICEF, New Delhi; [response 1](#))

Ministry of Water Resources, Government of India, 3rd Floor, Sinchai Bhawan, Patna, Bihar; Tel: 0612-2233591; Fax: 0612-2217294/084

Subordinate office of Ministry of Water Resources, deals with floods and its management in Ganga Basin States

Related Consolidated Replies

Water Management Conflicts between Communities and External Actors, from Prema Gera, United Nations Development Organization (UNDP), New Delhi (Comparative Experiences). Water Community and UNDP Energy and Environment Practice Network. Issued 18 December 2005
Available at <http://www.solutionexchange-un.net.in/environment/cr-public/cr-se-wes-global-18120501-public.pdf> (PDF, Size: 273 KB)

Showcases the management of water conflicts (rural-urban, inter-sectoral, policy triggered) between communities and external actors

Responses in Full

Himanshu Thakkar, South Asia Network on Dams, Rivers and People, New Delhi

The first thing about Kosi floods is that it is a completely man made flood, entirely due to the neglect of the embankment on Kosi in Nepal. It was Government of India's responsibility to maintain this embankment as per the Indo Nepal Kosi Treaty of 1954.

Unfortunately, there is even now there is no process in place to identify those responsible for the unprecedented man made flood disaster. As it happened in case of the Ukai floods of 2006, and numerous others, we may never know who are responsible for these man made disasters. An article on this issue can be found at: http://www.sandrp.in/floods/Kosi_Tragedy-Blunder_after_Blunder-Sept2008.pdf

We should not loose focus on this issue of holding the responsible people accountable, while we discuss the conflicts around this.

Incidentally, a very good book on Kosi floods by possibly the most knowledgeable person on this issue, Dr Dinesh Kumar Mishra has just been published. See the details at: http://www.sandrp.in/floods/Trapped_Between_the_Devil_and_Deep_Waters.pdf

Prashant Hedao, L'avenir d'Auroville (Auroville Planning and Development Group), Auroville

I also saw a movie "*Dui Paatan Ke Beech Mein*" sometime last year, which clearly shows what [Himanshu](#) has mentioned. It is worth seeing if you want a deeper understanding of the floods in northern Bihar.

Nitya Jacob, The United Nations Children's Fund (UNICEF), New Delhi (response 1)

The film Prashant mentions was shown at the Vatavaran 2003 film festival in Delhi and has been made by documentary filmmaker Arvind Sinha. Shot extensively in North Bihar, this film looks at the development models chosen and implemented, often by force, that have destroyed the livelihood of millions of people. Over the years, with each consequent flood, people developed their own coping mechanisms, which soon became integral to their culture. Man-made floods and water logging over vast agriculture land has pauperized the people of Bihar. All this has been done to "protect people from floods". You can find out more at this http://www.cmsindia.org/vatavaran/the_festival/water/11.htm.

B. L. Kaul, Society for Popularization of Science and Progressive Educational Society, Jammu
Himanshu Thakkar has rightly pointed out there is more an urgent need for better accountability among the legislature and the executive arms of state. This will help to stave off disasters such as the Kosi floods and even the bomb blasts in various towns. We need to search our hearts and think about it more seriously.

N. Sashikumar, National Institute of Advanced Studies, Bangalore

Can you please explain the following statement?

“The floods in Bihar have led to clashes between different stakeholders and those affected.”

Can you be more specific? What clashes have happened because of floods and between whom? As I understand its people who are left to suffer because of a lack of response from the authorities.

Abhishek Mendiratta, Consultant, New Delhi

Conflict is a process that begins when one party perceives that another party has negatively affected, or is about to negatively affect something that the first party cares about. The conflicts are caused by the scarcity of a resource — say, money, food items, shelter or water at the time of floods.

The dimensions of conflicts are:

- Cooperativeness: the degree to which one party attempts to satisfy the other party's concerns at the time of flood
- Assertiveness: the degree to which one party attempts to satisfy his or her own concerns
- Specific Intentions of conflicting parties
- Competing: A desire to satisfy one's interests, regardless of the impact on the other parties.
- Collaborating: A situation where the parties to a conflict each desire to satisfy fully the concerns of all parties
- Avoiding: The desire to withdraw from or suppress a conflict.
- Accommodating: the willingness of one party in a conflict to place the opponent's interests above his or her own
- Compromising: A situation in which each party to a conflict is willing to give up something

Conflict Resolution Techniques

Problem solving

Face-to-face meeting of the conflicting parties for the purpose of identifying the problem and resolving it through open discussion.

Superordinate goals

Creating a shared goal that cannot be attained without the cooperation of each of the conflicting parties.

Expansion of resources

When a conflict is caused by the scarcity of a resource—say, money, food or shelter —expansion of the resource can create a win-win solution.

Avoidance

Withdrawal from, or suppression of, the conflict.

Smoothing

Playing down differences while emphasizing common interests between the conflicting parties.

Compromise

Each party to the conflict gives up something of value.

Authoritative command

Management uses its formal authority to resolve the conflict and then communicates its desires to the parties involved.

Altering the human variable

Using behavioural change techniques such as human relations training to alter attitudes and behaviours that cause conflict.

Negotiation

A process in which two or more parties exchange goods or services and attempt to agree upon the exchange rate for them

If one or more techniques are applied the prevailing conflicts can be resolved.

Asha Ramesh, Wateraid, New Delhi

The issue under discussion is indeed pertinent and timely with the Bihar floods as the talking point.

Water conflicts as I see it are at different levels;

Macro and Micro

At the macro level, there is the whole issue of river water linkage and so on.

At the micro level, it is largely on issues related to day to day life. Here I find that we need to discuss and bring to fore the whole aspect of social exclusion and gender discrimination vis-à-vis water.

At the village level, a common sight is a fight to collect water and who collects water -WOMEN. They are hardly considered as useful members to discuss while designing or identifying points to provide access to water.

At the micro-level efforts to ensure, water for all is still a long way off. Where are water points located, often in the gullies of the dominant caste. This leads to conflict as water is something that all people need, yet there is such discrimination and ownership of water resources by the powerful.

I also feel while we are addressing issues around water conflict. While it is important to identify the causes that lead to the conflict, equally important is the need to evolve conflict-resolving mechanism. Strategies/interventions to conserve water so that availability and access is made easier, as a result of which the conflicts get reduced.

At the Macro level, it is much more technical and requires a lot of thought. Immediate to my mind comes the fact of rivers being sold off to large multinationals. Vast areas where indiscriminate ground water tapping is done for commercial purposes. The big farmers-kulucks who are digging countless bore well and directing all available water into their fields, resulting in water scarcity for the poor and marginal farmers, who then give up, sell their land and migrate into urban areas. This is the reality in the rural parts of the country.

These are some of the points that I have just quickly put down for you and I hope it will be of use in taking the discussion forward.

B. S. Bhavanishankar, Sahayoga, Bangalore

There is a conflict among the people who live within the Kosi valley bounded by the flood embankments and those who live outside as they get flooded from the catchment flows outside the embankments that prevent drainage. This has been the experience over several years since the embankments and the Kosi barrage in Nepal for protecting meandering rivers like Kosi were wrongly conceived and constructed. The combination has resulted in the breach that has caused untold and yet-to-be determined misery, damage to property, crops, and unknown loss of lives. The breach would have occurred, if not on 18 August, on a much bigger scale at some in the future.

Then there is conflict between government bureaucrats at all levels and the people who are affected by their unrealistic plans and implementation through the engineers. The flood has also seen conflict between politicians trading charges about the calamity.

On the issue of international conflicts over floods, Sahayoga conducted a workshop in Kolkata on 30 August. This is the first of a series of workshops on floods. Similar workshops are to be held in both Nepal and Bangladesh shortly. Following these, we will be organizing a seminar for participants from all

the three countries in Dhaka to remove the mistrust and conflicts already existing between the three countries. Bangladesh feels India, being a bigger country, is like a bully and does not control floods that cause misery, loss of crops and lives on a huge scale. Likewise, India feels that Nepal does not allow it to build dams in that country to control the floods. Nepal in turn says these dams will submerge its precious land and generate hydroelectric power, mostly for its own benefits. To read the proceedings of the Workshop on flood study please click <http://www.solutionexchange-un.net.in/environment/cr/res16090802.doc> (Size: 97 KB) and to read the Flood Study Report click <http://www.solutionexchange-un.net.in/environment/cr/res16090801.doc> (Size: 72 KB)

Thus, there is a great mistrust among all the three. And again, all three have a grouse against China, that it is likely to divert the Brahmaputra and dry up the flows in India and Bangladesh. There are conflicts amongst all the four countries. The workshop in Kolkata is the first of many steps to evolve an understanding among the countries. Later, it is proposed to include China as Brahmaputra is involved. This effort is being supported by the Regional Water Partnership in which all the South Asian countries are partners, and the India Water Partnership.

Again within each country there are regional and state-level conflicts on floods. Tamil Nadu feels that Karnataka sends floods down without controlling its dams. Likewise Karnataka and Andhra Pradesh have complaints against Maharashtra.

Sudhirendra Sharma, The Ecological Foundation, New Delhi

The Fact Finding Mission Report "Kosi Deluge: The Worst is Still to Come", in March 2007 asserts that embankments are the root cause of the present crises. It seeks firm policy decisions to remedy the situation. Though considered unlawful, trapped communities have time and again engaged in creating artificial breaches for draining their accumulated water from their surroundings. The general perception favours removal of embankments provided the act of demolishing does not create undesired conditions.

There is a precedence of embankment demolition in India. The embankments created along a length of 32 kilometers on river Damodar in 1854 were demolished in the year 1869. The British had soon realized that far from controlling floods, the embankments were submerging fertile lands for which the colonial rulers were forced to provide compensation. The first-ever compensation of Rs 60,000 on account of submergence due to embankment failure was given to a farmer in 1896 in then Bardwan district.

After their failure to tame rivers Rhine and Meuse, the Dutch hydrocracy has now adopted spatial flood protection measures called 'room for the river'. The new approach not only warrants informed public debate but is based on broad political support. It is measures like these that need to be discussed and negotiated with communities in north Bihar, but not before the political stables in Patna (and in Delhi) get cleansed of their misconceptions!

The report's co-author Gopal Krishna feels unless the erring officials and institutions are held accountable, not only will the past be repeated but fresh approaches and strategies would be hard to implement. It is clear from the origin, functions and constitution of the institutions dealing with water resources. They are all structured for planning, design and implementation of large projects but instead need to be participation oriented and open bodies. Therefore, a complete overhaul of the existing institutions is a dire necessity.

Do floods generate/create conflicts? On the contrary, flood control and (mis)management trigger conflicts. Take the case of the Kosi river, had there not been the embankments along the river course (over 135 km length) society would not have been divided. There are villages trapped inside the embankments who often want the river to be liberated of its jackets so that they could live unharmed. And, there are those outside the embankments on both sides who may want the river to remain jacketed

(embanked) such that they may not be inundated. Who divided the community? Who perpetuated flood-relief cycle? Who benefits from the consequences?

Move to Surat and other locations where dam-discharges create floods. Even the watershed projects induce upstream-downstream conflicts. I would imagine that floods induced by drainage congestion (be it dam, embankments, highways) are at the root of the issue. Ironically, in an effort to focus on 'conflict resolution' the root cause of the conflict is rarely taken into consideration. Not without reason had Bosseut said: 'we are afflicted by effects but seem to have accepted the causes.' Identifying causes, diagnosing their dynamics and fixing responsibilities should feature prominently in such discussions for building 'hydro-solidarities'.

Nitya Jacob, The United Nations Children's Fund (UNICEF), New Delhi (response 2)

The current floods in Bihar have brought to the surface a simmering conflict between 15 lakh people living inside the embankments of the Kosi River, and the 30 lakh living outside them. Those within are relieved the river burst its embankments so they have been spared the annual floods. On the other hand those outside are furious and allege lack of maintenance and negligence on the part of the Ganga Flood Control Commission, Patna. The Commission oversees the Kosi High Level Committee, which is responsible for ensuring the embankments are repaired.

The divide between those within and without embankments is so sharp, according to Dr. D K Mishra, author of a recent book on the Kosi River, that both sides are planning protest marches on October 18. Those living inside the embankments do not want them repaired to end their annual misery of floods. The other group wants them fixed and strengthened.

Containing the Kosi has been a contentious issue for centuries. The British balked at the idea realizing the annual floods were 'gentle' and did not cause much damage – there were two disastrous floods in over a century. Rather, these annual inundations enriched the soil of the region, enabling people to grow two crops.

The silt load was considered too high for embankments to be viable as the riverbed would rapidly silt up, raising the level of the river and necessitate higher embankments; there is a height above which embankments become ineffective. The silt load is 92,000 acre feet a year, and causes the river bed to rise around 5 inches a year in the lower reaches of the river.

However, post-Independence, the government of India constructed the current system of embankments between 1955 and 1963. Its reasoning was the river will dredge itself and keep the silt from accumulating, and eventually make channels deep enough so it will not overflow the embankments or threaten them in any way.

Since the embankments were completed in 1963, they have given way eight times with disastrous results. This has also heightened conflict between people and the authorities, as well as between India and Nepal (as has been described by Bhavanishankar).

Experts who have visited the areas feel immediate steps are needed to mitigate the suffering of people followed by a phased plan of deconstruction of embankments so the Kosi River can flow naturally. This would reduce the severity of floods and eliminate the conflicts caused by the embankments between those living within and those without. They state there is a strong case for returning to the earlier state, though the transition is likely to be painful and slow.

Lt. Col. Praveen Srivastava (Retd), Tranzlease, Pune

The policies, reasons and remedies for flood control are already documented and available for study. The problem is in:

- its execution
- allotment of fund
- making a road map for implementation
- making people aware of the impending tragedy so that they can save their lives and reach a safe location
- plan out to tackle the emergency for e.g.: floods are routine affair in eastern region but what actually has been done except state asking for funds after the catastrophe
- As an interim measure, until the projects start the likely affected population must be moved to a safer place before the impending floods irrespective of the fact whether it actually takes place or not.

B. L. Kaul, Society for Popularization of Science and Progressive Educational Society, Jammu

Water is the elixir of life. So its importance in development and growth of most human civilizations has always been there. Conflicts for controlling water are a historical fact and many wars were fought in the past for control of sources of water like rivers and lakes. Even today, water remains a matter of conflict between many countries.

In our country, unfortunately, we have witnessed conflict between various states on sharing of water. There is also conflict witnessed even at the village level to control water. This is especially true of the states where rice is grown. At night, some people stealthily divert water from a neighbour's plot to their own plot. When this is detected in the morning, a conflict ensues often turning violent.

Human nature being what it is it is the duty of the State to discipline people and teach them how to conserve and share a natural resource like water. In some of the states, where power is supplied free of cost to the farmers, it is painful to see how ground water is exploited mindlessly. The pipes used are oversized and water is allowed to run beyond genuine requirement resulting in lowering of water table.

The discrimination in using well water or tap water for drinking purposes on caste basis is unacceptable. It is the duty of the State to see that such practices are stopped. Conflict resolution so far as distribution of water is concerned is something which needs attention of all-the citizens and the State. It is equally important that potable water should be clean and free from contamination for protecting health of the people both rural and urban.

Binayak Das, Arghyam, Bangalore

There will be people opposed to embankment demolition and they include the majority of the population, employed due to embankment construction. But decisions have to be made. A start is required.

One is the need for a steady campaign against embankments, especially in Bihar among the affected and beneficiary populace including the politicians and bureaucrats. India's frenzied media should start debating about this. Another is the requirement for a simulation model to understand what will be the impact of embankment demolition. What will get affected (roads, habitations, other infrastructure, etc) after embankments are demolished due to river and flood flows released from trapped embankments?

It should also look at flows at different seasons, taking into account impacts of climate change also. Another study has to look at socio-economic implications of such a move. And a third should plan rehabilitation of affected population and infrastructure due to embankment demolition.

Complete embankment demolition is probably not possible but studies are required. Then solutions like 'room for the river' can be explored. Radical shifts are required or else, the every year flood story will be repeated with greater intensity.

Shalini Jain, SEEDS, New Delhi

Conflict itself is a manmade disaster that precipitates other hazards such as, migration, displacement, loss of human lives, gender imbalances, effect on food water and livelihood security, scarcity and pressure on available resources.

Women are more vulnerable groups in extreme natural events to abuse (injury, death, rape, forced labour) during conflict situation. In normal times, accessing water for fulfilling the basic needs of their family is a backbreaking and difficult task for women and becomes yet more challenging at times of disasters, when the water resources become highly limited, inaccessible and inadequate to fulfill the needs of all. In disaster situations, approach of women to these water points gets more constricted and curtailed because of her low social status. In this fragile environment, where social services degrade or disappear, women are often sexually assaulted and exploited to gain access to scarce resources like water.

The opinions and the interests of women and vulnerable groups should be kept in mind while identifying the points for water. Facilitating a social dialogue within the community could help in sensitization process. Besides, Community based participation by involving both men and women to explain their needs and capacities and involvement of women in decision making while designing programs and their implementation at the grassroots could prove to be vital in resolving conflicts related to water in long term.

Pranab R. Choudhury, Independent, Bhubaneswar

Floods probably present a picture of paradox with reference to the ongoing discourses on water conflicts. Besides being the manifestation of untypical 'water-excess' situations, their relative unpredictability (with respect to magnitude, intensity and stakeholder segregation) and largely seasonal expressions put the flood-conflicts in a different water-conflict bracket, necessitating a different treatment.

While their epidemic like extent and intensity coupled with huge socio-economic impacts make the floods-related conflicts difficult to ignore, study, analysis and resolution of such conflicts continue to remain a big challenge. The key aspects of the conflicts-study-frameworks such as defining and delineating boundaries of the conflict, stakeholders and conflict analysis etc. are very complex in the flood context. Quite often also, these conflicts remain hidden, or get fizzled out with water-receding or struggle to manifest at different levels. Though the debates continue at macro-level, most of the flood related conflicts either manifest at local levels (village, Gram panchayat) or remain passive. There have also been local instances where floods have been the outcome of conflict, rather than floods provoking conflict.

Taking the case of Orissa, which has been perennially struggling with floods, and which, quite ironically now is marooned under the worst ever flood in its living memory, let me present some cases of flood related conflicts, especially to bring out some conflict-related issues to forefront.

At the macro-level, Orissa's flood conflicts are quite akin to that of Kosi or other Indian rivers. These discourses embedded in the dams and reservoir operations, embankments (river jacketing/subjugation), drainage congestions and silting up of riverbeds put up squarely the flood-affected/vulnerable (or their protagonists) against Government as the conflicting stakeholders. But at this macro level, there are also

some other dimensions to conflicts and stakeholders, which have not been surfaced so far conspicuously, though simmering are there. This is related to the basin level connectedness between the upstream land users with that of deltaic populations.

Highly erosive upper catchments of Orissa's rivers, their typical sudden fall into a very flat delta and the unique confluences, which impede a faster flushing into the sea, make the upper catchment land use also a critical factor contributing to the flood. While the faster and higher runoffs add to more number of peak floods, heavy soil loss add to the silting up of channel beds in the flatter delta, often multiplying the flood spill and damages. In absence of regulation/incentivization, the dominant upper catchment land uses of mining, industrialization and subsistence agriculture continue to abate their contributions to flood. With floods almost happening regularly and losses to life and property mounting for the flood-plainers, eruption of conflict may not be far with the flood-inducing upper catchment land-users.

Another dimension of flood-conflict in Orissa at macro-level is rooted in the alleged relief-dependence of the hydro-governance and quite often quoted 'civil contractor-criminal- politician' nexus in flood (mis)management. This has inspired a satirical quote 'everybody loves a good flood in Orissa'. While these elites and powerful continue to be the greatest benefactors of the floods, the deltaic population continues to suffer meekly. With ravages of the flood spilling to non-traditional areas outside embankments, particularly in the recent floods with more than 100 breaches and affecting millions more, the segregation and alignments of these conflicting stakeholders are on the cards.

On the micro-scale, the flood-conflicts are more conspicuous with boundaries and stakeholders often clearly defined. These conflicts are largely the manifestations of competitions to escape from floods or results out of ulterior motive to gain economic or political mileage out of flood. Examples range from sponsored breaches by neighbouring villagers to contractors encouraged breaches (to get more works) to instances of political-leaders-sponsored breaches to save their affiliate villages at the cost of others. Sometimes breaches are done intentionally to settle scores. In the recent flood, there was a case of conflict taking a turn towards violence with alleged blank firing, between railways (RPF) and the flood affected communities who were trying to dig up the railway track to drain floodwaters to the other side.

Similarly, the escapes constructed by the Water Resource Department at the upper part of the lower catchment to prevent flood in the down side of the catchment, through release of excess water into surrounding *doabs* have brought in severe flood hazard in the immediate areas. Such escapes, while provide escape to downstream villages and urban areas, put tremendous amount of pressure on upstream villages and agriculture lands. We have seen more than 4 ft of sand casting in thousands of acres of lands along with creation of new rivers near an escape in the Baitarani, which has been provided to save downstream Jajpur town. Segregation of stakeholders around escape is conspicuous though conflicts continue to remain passive.

With floods poised to increase in frequency and intensity with climate change, the damages as a result of ill or lack of planning are also going to expand and multiply. From conflict viewpoint, better understanding and deeper analysis of the contexts, causes and effects are required to identify and analyze the conflict and the stakeholders as well as to initiate work towards conflict prevention and resolution.

[Benita Sarah Mathew](#), Social Performance Management Unit (Research), ESAF, Kerala

Water is precious for all beings; hence, a sudden disruption in its availability or disasters caused by their disturbances creates calamities or disasters. In rural and less privileged areas especially in disaster prone vulnerable places, conflicts arise as soon as there is a surplus or lack of anything. What is necessary is to prepare the communities beforehand on economic and social fronts so that they are better able to manage the disasters and conflicts.

During and after disasters people are caught unawares and slowly returning from the shocks, which have created havoc to their personal and social lives. Hence, water conflicts are one among the various aftermaths, which need timely and effective handling of the situation on ground by the field social animators. They need to assess the effects of the disaster, try to bring the community closer and unite it to confront the challenges ahead. This helps build a platform for the people to calm and comfort one another.

Water and related needs will be among the first priority areas for the community in the work towards their economic development hence measures need to be taken in the initial stage, i.e., during community mobilisation itself. It helps in binding the community together and reduces chances of conflicts. Women are more vulnerable to any conflicts along with their children as discussed in various forums, hence whatever implementation programs or initiatives are planned should be done to address their needs & issues first, which will further help in providing a wider platform for preparedness and redevelopment opportunity after disaster strikes.

Neelima Garg, Uttarakhand Jal Sansthan, Dehradun

This year, for once, the devastating floods of Bihar seem to have touched us. Last year, when the same region was reeling under what was said to be the worst floods in living history, we simply did not know. Media had flashed a few images, but it was more of the same: rivers flood this region every year, so what's new? What's there to say?

This year there are some differences: first, the breach in the Kosi's protection system of embankments and barrages took place in Nepal, not in India. As maintenance of the embankments was our responsibility, we could not blame Nepal for the floods. We had to look within.

Second, the area, drowned under the flood, was massive and millions were marooned in remote villages. This was partly because this time the river breached upstream of the Kosi barrage and spilled over the land, forgetting that it even had a course to run before it flowed into the Ganga. Remember, this is a river, which has changed its course by 120 km in the past 250 years—satellite images show 12 distinct channels of how the river has moved.

Third, and most important, the flood captured our attention, because of the scale of the human tragedy. It was made clear that in spite of all our big talk and even bigger institutions for disaster management, we remain unprepared, under-staffed and unequipped for a crisis, when it hits. Even as people waited to be rescued we had few boats to bring them to safe places; we had little food, water and shelter to provide for them in the relief camps; and worse, we had no authority to ensure that empty homes would not be ransacked. As a result, people refused to leave. They preferred the swirling water to relief camps. What an indictment of our efforts.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Disaster Management Community in India at se-drm@solutionexchange-un.net.in and/or Solution Exchange for the Water Community in India at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-drm] Query: Flood Induced Water Conflicts - Experiences. Additional Reply."

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