



BRAHMAPUTRA KNOWLEDGE EXCHANGE PROGRAMME

Report



**The Transnational Policy Dialogue for
Improved Water Governance of
the Brahmaputra Basin: Phase III**

20TH-22ND NOVEMBER 2016
VENUE: DONYI POLO ASHOK, ITANAGAR

SaciWATERS
SOUTH ASIA CONSORTIUM FOR INTERDISCIPLINARY
WATER RESOURCES STUDIES



WRD

Water Resource Department
(Govt. of Arunachal Pradesh)

Program Agenda

Day1: 20th November 2016

Inaugural Session

18:15-18:30	Welcome Address Dr. Aditya Bastola , Senior Fellow, SaciWATERS Dr. Rabindra Kumar, (IFS) PCCF, Department of Environment and Forests, Arunachal Pradesh
18:30-18:40	Overview of the Program- Ms. Safa Fanaian , Research Fellow, SaciWATERS
18:40-19:00	Special Address: Shri Kamlung Mossang , Honorable Minister (WRD, Geology and Mines, Food and Civil Supplies, Arunachal Pradesh)
19:00-19:10	Shri. Tapir Gao , Ex. Member of Parliament (BJP), Arunachal Pradesh
19:10-19:25	Shri. A.K. Mitra , Former Secretary Water Resources Department, Assam and Chairman Technical Advisory Committee
19:25-19:30	Vote of Thanks - Vishaka Gulati , SaciWATERS

Day 2: 21st November 2016

Time	Program
9:30-10:00	Registration and Tea
10:30-10:40	Opening Remarks Dr. Aditya Bastola , SaciWATERS Sharing of Experiences and Outcomes of Brahmaputra Dialogue Ms. Safa Fanaian , Research Fellow, SaciWATERS
10:40-12:30	Theme: Flow Pattern and River Erosion Moderator: Shri. A.K. Mitra <ul style="list-style-type: none">• Shri A.K. Mitra, Former Secretary Water Resources Department, Assam, Chairman Technical Advisory Committee• Shri. Pura Tupe, Chief Engineer, Department of Hydropower Development, State Government of Arunachal Pradesh• Shri. Dibakar Bhattacharjee, Chief Engineer, Water Resources Department, Assam• Shri Pradeep Puzari, Ex. Brahmaputra Board, Consultant, Patel Engineering Ltd• Dr. Navarun Varma, Fellow TERI, New Delhi• Prof. Lakhi Prasad Hazarika, Department of Zoology, North Lakhimpur College Discussion
14:00-15:30	Theme: Realities from the Ground Moderator: Ms. Jarjum Ete <ul style="list-style-type: none">• Adv. Vijay Taram, Community Representatives, Arunahcal

Pradesh

- **Ms. Jarjum Ete**, Arunachal Pradesh.
- **Dr. David Gao**, Department of Political Science, Rajiv Gandhi University
- **Mr. Manik Barua**, Centre for North Eastern Studies and Policy, Guwahati

Discussion

15:30-17:45 Theme: **The River and its Ecology**

Moderator: Dr. Sanchita Boruah

- **Mr. Mirza Zulfiqur Rahman**, Research Scholar, IIT-Guwahati
- **Dr. Partho Jyoti Das**, Program Head, Water, Climate & Hazard Division at Aaranyak
- **Dr. Sanchita Boruah**, Dibrugarh Hanumanbax Surajmall Kanoi College
- **Jayshree Hazarika and Bandita Barman**, Research Scholar, IIT-Guwahati
- **Prof. Nishamani Kar**, Professor, Dept. of Geography, Rajiv Gandhi University, Arunachal Pradesh

Discussion

17:45-18:00 Summarisation- Ms. Safa Fanaian

18:00-18:05 Vote of Thanks

Day3: 22nd November 2016

Field Trip: To convert the information gathered into an understanding of the reality a field trip will be held on 22nd November 2016.

Venue: Gerukamukh Lower Subansiri HEP, Arunachal Pradesh

Programmatic Introduction

Building communication and knowledge across stakeholders is considered a keystone for enhancing effective governance within transboundary river ecosystems. In an effort to facilitate communication and knowledge, while building trust and confidence across and within boundaries in the Yarlung Tsangpo-Brahmaputra-Jamuna Basin (hereafter referred to as Brahmaputra Basin), SaciWATERS along with its partners since 2013 has been leading the effort- “Transboundary Policy Dialogue for Improved Water Governance in Brahmaputra River” (*Brahmaputra Dialogue*).

The Brahmaputra Dialogue is a platform for discussion of challenges, opportunities and avenues towards improved co-management of the river basin. The project began with a group of researchers from India and Bangladesh in 2013 as a bilateral initiative. It has now grown to a multilateral initiative including China and Bhutan. The major achievements till date have been:

- Willingness among the different stakeholders to consistently participate and enhance specificity within the dialogue process.
- Establishment of a platform for the exchange of ideas and concerns among these stakeholders has been established.
- The diverse background of dialogue participants ranging from bureaucrats to academics, Civil Society Organizations (CSO’s) to key community members, has served to enrich every ensuing discussion.

The overarching aim of this initiative has expanded towards a basin-level joint institutional framework for strengthening the co-management of the Brahmaputra Basin. This framework seeks to be informed by a common knowledge base, include plurality of views, based on trust and confidence, built with political will and support, involving improved capacity of stakeholders.

Brahmaputra Knowledge Exchange

As the Brahmaputra Dialogue grew in depth and breath, one element of concern that consistently emerged was the different levels of knowledge and varied perceptions that existed across stakeholders about the river and each other. Another concern was the lack of space for communication and sharing of the information that exists within the Basin. There are towers of technical knowledge and policy about river that are inaccessible by both the communities and the local NGOs. In parallel, a knowledge gap was also identified among bureaucrats, technocrats and academicians about the realities faced within the basin, solutions required and their communication thereof.

The two-way communication and knowledge gap led to an opportunity to initiate a **Brahmaputra Knowledge Exchange** platform within the Brahmaputra Dialogues. The purpose of the Knowledge Exchange platform is to:

- Translate scientific and technical information on the Brahmaputra River into a common and shared understanding about the river.
- Bridge knowledge gap on science, policies and common perceptions about the Brahmaputra River.
- Contribute to bridge the communication gap between state and non-state actors within the region.

- Create a common knowledge base that can assist in equitable and informed participation of different stakeholders in future joint dialogues.

The first Brahmaputra Knowledge Exchange Program was held in **Itanagar, Arunachal Pradesh** from **20-22nd November 2016**.

Day 1: Inaugural Program (20th November)

Formal Inauguration of the workshop began with lighting of the lamp) by the chief guest and guest of honor.

Chief Guest: Shri Kamlung Mossang, Honorable Minister (WRD, Geology and Mines, Food and Civil Supplies, Arunachal Pradesh).

Guests of Honor:

- Smt. Gum Tayeng, Honorable Parliamentary Secretary, Water Resources Department (WRD), Arunachal Pradesh
- Shri. Tapir Gao, Ex. Member of Parliament (BJP), Arunachal Pradesh
- Shri. A.K. Mitra, Former Secretary Water Resources Department, Assam and Chairman Technical Advisory Committee
- Shri. Pura Tupe, Chief Engineer, Department of Hydropower Development, State Government of Arunachal Pradesh



Dr. Aditya Bastola, SaciWATERS welcomed the chief guest and guest of honor for the program along with all the participants. Dr. Bastola highlighted the importance of a dialogue among the riparian states along with willingness for an enabling environment to share issues and challenges for cooperation in the Brahmaputra river basin. This willingness is being manifested by the growing inclination to participate in the dialogues among the involved stakeholders. The support of Department of Environment and Forestry; and The Water Resource Department of Arunachal Pradesh, has been instrumental in taking ahead the Dialogue within Arunachal Pradesh.

(Presence of representatives from both states)... shows the importance of dialogue for upper and lower riparian states, but also the willingness to create an enabling environment for sharing issues and challenges for cooperation of Brahmaputra River Basin –Dr. Aditya Bastola, Senior Fellow SaciWATERS.

Ms. Safa Fanaian gave an overview of the Brahmaputra Dialogue Initiative, its journey since 2013 and the goals that it seeks to achieve. She highlighted the achievements and learnings that emerged from the three phases of the Dialogue. Ms. Fanaian underscored importance and purpose of gathering in Itanagar as a means to further the dialogue process by expanding the stakeholder involvement and building a two-way bridge of knowledge sharing and communication between bureaucrats and CSO.

Giving the opening address of the gathering, **Dr. Rabindra Kumar** (IFS), PCCF, Department of Environment and Forests, Arunachal Pradesh emphasized the complex, diverse and unique nature of Brahmaputra that originates from Mansrovar Glacier. Dr. Kumar mentioned the challenges related to development in upstream regions and the uncertainty that downstream users face. He also mentioned the uncertainty that past precedents have set in the name of dams and development on rivers and how they lay a dark shadow over the current development plans. The challenge and fears are not only within India but also across upstream and downstream countries. Dr. Kumar further highlighted how the institutional arrangements along with limited data have hampered functioning of the existing Brahmaputra Board. Further he stated that the challenges of governance are not only between countries but also within (Assam and Arunachal Pradesh). The approach to address these challenges, Dr. Kumar mentioned, is through dialogues at every level. Dialogue is an essential platform that would bring views of multiple stakeholders together to address challenges and identify opportunities. He concluded his address by mentioning that it is essential for all to come together to share data, knowledge and efforts so as to prevent loss of lives during natural calamities.

Hon'ble Shri Kamlung Mossang began by appreciating the importance of Dialogue in trans-boundary governance processes. While identifying the unique feature of the Brahmaputra he also highlighted that “dialogue process should lay a concrete foundation to device mechanism is such a way that there is equitable distribution of benefits among the different stakeholders”. Hon'ble Shri Mossan highlighted that communities living on the banks of the river are facing land degradation and are losing their lands due to erosion and flooding which is leading to increasing encroachment within the national parks due to resettlement.

...dialogue process should lay a concrete foundation to device mechanism is such a way that there is equitable distribution of benefits among the different stakeholder –Shri Kamlung Mossan Honorable Minister (WRD, Geology and Mines, Food & Civil Supplies, Arunachal Pradesh).

He further highlighted the tragedy faced by women who are caught in between these decisions and have to bear the burden of managing agriculture, in addition to childrearing and managing resources. Any affective water management strategy should therefore address the issue of availability of water in the dry season, managing flood, livelihoods, erosion during monsoons, catchment development and hydroelectric development. For any effective implementation of policy, communities need to be taken into confidence. These issues are inter-related and require a comprehensive plan to address them in holistic manner. He also spoke of the cultural heritage of the river along with its relevance for sustainable livelihood and development. He concluded by mentioning the

need to expand the dialogue to include the context of its surrounding environment as well.

... the approach is to have more and more dialogues at every level between countries and states and develop a joint Brahmaputra commission where things can be brought to one single platform for policy decision=making –Dr. Rabindra Kumar (IFS), PCCF, Department of Environment & Forests, Arunachal Pradesh

Shri. Tapir Gao, shared about the opportunities and possibilities for collaboration for effective governance of the river across the countries and states. Initiatives of this kind are filled with hurdles and the geo-political scenarios are such that progress in one region could

We will have the consensus, one fine day, it will bring the benefits of water resources which contributes to the 37% of the total resources of the country –Shri A.K. Mitra. Former Secretary Water Resources Department, Assam.

mean digress in another. To address this he spoke of the importance of bringing science and research of the environment into the geo-politics of the region. Utilize this platform and research to bring together countries into close contact for future possibilities of collaboration.

Shri A.K Mitra reflected upon the challenges of trans-boundary dialogue and stated that- “if conflict can be there why not cooperation?” He reflected upon the Mekong deliberation which with its extensive diversity and problems took 37 years of consultation and dialogue, then why not have a similar or better process in Brahmaputra? Maybe at some point of time different dialogues can converge. “We will have the consensus. One fine day, it will bring the benefits of water resources which contributes to the 37% of the total resources of the country.”

The session concluded with a vote of thanks and welcome for the next days’ program by Ms. Vishaka Gulati

Day 2: Knowledge Exchange Program

The second day of the Brahmaputra Knowledge Exchange program was opened by Dr. Aditya who mentioned about the SaciWATERS and its role in the Brahmaputra Dialogue initiative. Ms. Fanaian framed the purpose of the gathering as a two-way knowledge exchange within the larger goals of the Brahmaputra Dialogue for enhanced capacity, trust and willingness towards effective governance. To emphasize upon modes and means for inclusive participation, Ms. Gulati highlighted the challenges and approaches that can be utilized to build effective and inclusive community participation in Dialogues.

The program of the day was outlined along with session theme that were to be covered, speakers and intent each session aimed to create. The sessions included mixed group of presenters on each theme to understand various perspectives and also to enable cross-exchange of information. Each presenter spoke about the issue from their perspective, the challenges faced due to it and the solution options available. The discussion that ensued after each session, strove to create a holistic picture of the problem and its solutions.

Session 1: Flow Pattern and River Erosion

Moderator: Shri. A.K. Mitra

- Shri A.K. Mitra, Former Secretary Water Resources Department, Assam, Chairman Technical Advisory Committee
- Shri. Pura Tupe, Chief Engineer, Department of Hydropower Development, State Government of Arunachal Pradesh
- Shri. Dibakar Bhattacharjee, Chief Engineer, Water Resources Department, Assam
- Shri Pradeep Puzari, Consultant, Patel Engineering Ltd
- Dr. Navarun Varma, Fellow TERI, New Delhi
- Prof. Lakhi Prasad Hazarika, Department of Zoology, North Lakhimpur College

Opening the session, Shri A.K. Mitra, gave an overview of floods and erosion problem in Assam which houses 44 major tributaries and 126 sub- tributaries. The Brahmaputra he stated is a river of myth and mystery. It also changes as it flows through Arunachal and Assam. Both the regions, even though within India, have different context and regional challenges. Assam faces challenges of frequent floods, hugging of erosion in one region and sediment loading in another. It also has been noted that people affected by floods per square kilometer has been increasing in the past decade growing from 100 to 500 per km².

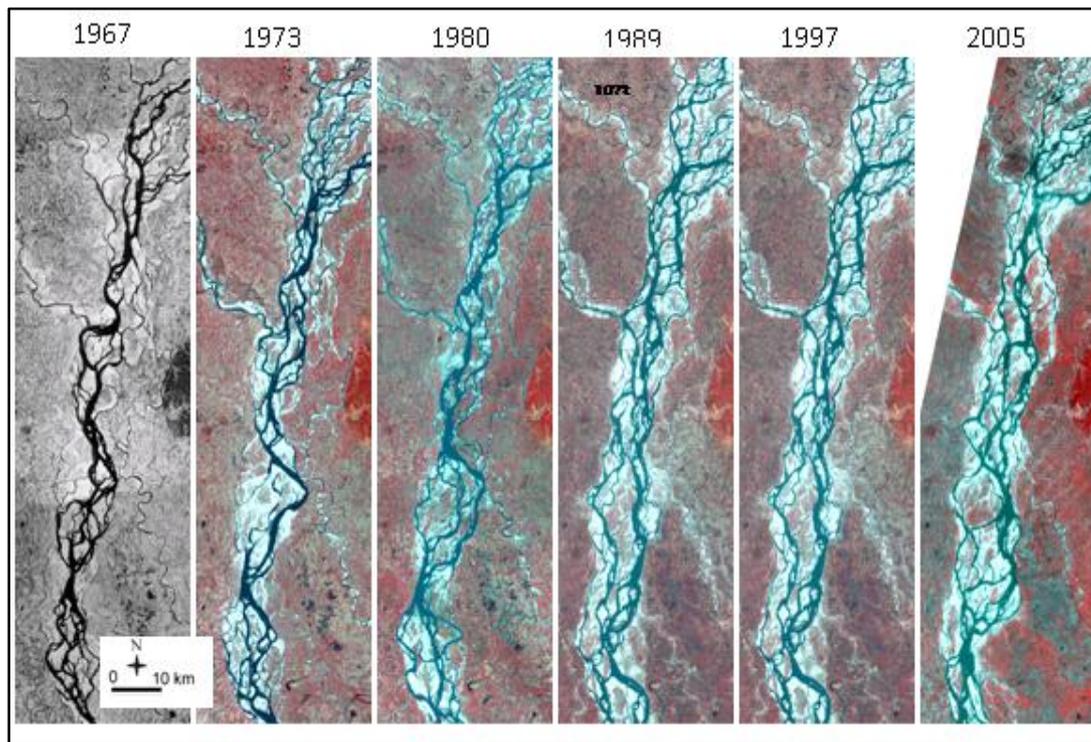


Figure 1: Changing nature of the river course and its braiding (Source: Mitra 2016- Presentation)

Flood damages have resulted in massive costs which was estimated to be around INR 62000 crore in 2010. Erosion rates are also increasing. An average of 8000 ha is being lost to erosion annually. Instability of the river with continuous bank migration attributes to its widening. This decreases the overall carrying capacity of the river and increases braiding possibilities. Shri. Mitra mentioned the different short terms and long term structural and non-structural measures that have been taken by the government to curb erosion. There are many lessons we can learn from other rivers such as Hwang-Ho river (Yellow River) on its sediment and erosion management. The challenges however, are still unresolved.

Some of the most important options to address this challenge are:

- Carrying forward and focusing on long-term measures,
- Collaborative and interdisciplinary efforts of both upstream and downstream state departments and researchers.
- An ecologically balanced regional plan should be developed to address the challenges of this interstate and international river.
- For effective execution of plans a regional framework is required that is accepted by stakeholders. It would include strategies for national and international cooperation to ensure food security, health security, and ecological security

Shri. Pura Tupae, conveyed the challenges Arunachal Pradesh is facing in provision of electricity shortages. He also pointed to the development drive that is being sought within the State and the complementary utilization possibilities of its water resource potential to enable development. The Brahmaputra and its tributaries face regular floods and landslides that have disastrous effects on downstream. One structural intervention to avoid these problems he suggested are multi-purpose dams for flood and land protection. Shir Tupae also spoke about the challenges of bringing together states and department for consultation and collaboration towards effective governance of the rivers resources. Addressing the issues of neighbors' cooperation for the river management he suggested that:

- Efforts like the Dialogues being carried out by SaciWATERs can assist in building bridges and connections. These efforts provide a platform for consultation.
- He also suggested that these efforts be carried forward to cross-country as well so that there is collaboration among the riparian neighbors.

Shri. Dibakar Bhattacharjee, mentioned the need to change our views about the river, and look at it as a resource to be effectively managed. Shri Bhattacharjee pointed out that current utilization is only 5% of the river's resources. He mentioned the lack of its effective management has resulted in loss of fertile lands in Arunachal along with high sediment load and land-loss due to erosion in Assam. He emphasized about the need to address the issue of land loss along with the management of growing extremes of drought and floods linked to rivers. He mentioned that some points of collaboration include:

- Designing joint mechanism for averting loss of land and erosion
- Joint study of selected tributaries that would enable creation of mutual benefit collaboration for both Assam and Arunachal Pradesh

Shri. Pradeep Puzari, a retired member of the Brahmaputra Board, based on his experience of working on the river mentioned about the main concern being faced-erosion. However, both the problems of erosion and flood are rooted in silt! Shri. Puzari, mentioned that the understanding about the river is limited, also because the cross-sections of the river are ever changing. Further the causes for erosion are known but the challenge of tackling silt sediments still remains. Solutions that may have worked in another river basin may not work in Brahmaputra. Direct transference of strategies from other river basins might not assist the complex nature and governance complexities of Brahmaputra River. He also pointed out that flows into Brahmaputra are to a large extent contributing towards watersheds within India. Media plays a key role in information

"We have not understood the nature of the river till now- Shri. Pradip Puzari, Former member Brahmaputra Board

"Since 1950 we have already lost twenty seven thousands hectares of land due to erosion. - Shri. Dibakar Bhattacharjee Chief Engineer Water Resources Department, Assam.

dissemination and currently there are many controversies around the developments that are occurring on the river within and across riparian countries. Addressing erosion, silt and governance issue Shri Puzari pointed out requires:

- Joint and properly planned erosion protection schemes within not only

Arunachal Pradesh and Assam but also in Bangladesh.

- Assess the needs of the region before we demand for water, there is a need to know how much is actually required and for what purposes.
- Both technical information and realities need to be included within media coverage to present a true picture of the river.
- Adequate study of the river is required. Implementation of short-term measures such as dredging of the river without adequate planning and third party studies might lead to severe long-term consequences.
- Platforms to build capacity and collaboration towards governance of the river will allow long-term positive impacts.

Dr. Navarun Varma from his extensive work with different stakeholders across the river found out that there are different ways a problem is seen by different stakeholders. He also mentioned that integrating different disciplines of study on the river provides a larger and more robust picture of the reality of the river. This includes information ranging from different communities living on the banks to the narrative of government officials. He also shared the different views that are present among different actors and how they view each other as well within the wide range of efforts being expended on the river. Communication and models Dr. Varma suggested helps in redirecting the focus from people to problem. In his field work Dr. Varma has found narratives from Mishing communities which saw erosion of their fertile lands as a disaster but from the perspective of policy, revenue and disaster management actually missed the linkages between embankment breach and land allocation. This leads to large-scale migration, alternative livelihoods being taken up, increase in wild-life human conflicts. Within field work and discussions held it was noted that communities are distrustful of government and consultants. He also found that NGO's hold a special position of trust along with access knowledge. Dr. Varma based on his work suggested the following measure:

- In discussion about governance challenges of the river redirect focus towards models and maps that help in arrive at the best solution for the basin
- NGO's can serve as knowledge brokers and go-between government and communities.
- Each stakeholder's views are informed by particular discourses, and integrated and trans-disciplinary approach would call for dialogue among various stakeholders so that views are integrated.
- Need to devise mechanisms for institutionalizing social learning.
- Need to create bridging organization, bring in autonomous councils including community representatives into disaster management.
- Identify change agents who can take back messages and enable will.

There is a need for shared understanding and (it's a) prerequisite of trust across people who have different kinds of worldviews. - Shri Dr. Navarun Varma, Fellow TERI, New Delhi

To achieve this goal (sustainable development) we need to maintain the health of the river. Not only physical or biological matters but socio-economic concerns - Prof. Lakhi Prasad Hazarika

Prof. Lakhi Prasad Hazarika, highlighted elements essential for a healthy river system, this includes not only the physical and biological but also socio-economic concerns. Prof. Hazarika and his team have been studying the changes of the tributary Subansiri. His

observations have shown that the river has been continuously migrating westwards for the last fifty years. It was also noted that in the recent years, the sediment load has been increasing at a fast pace and does not anymore correlate to the discharge of the river. There is an average 43% increase in the sediment load and this change brings in many problems for the wildlife and also on possible downstream infrastructure constructions. Prof Hazarika suggested that

- Such increase in sediment load is a challenge and needs to be addressed in an integrated manner including both physical and socio-economic measures.

Discussion



Q.1. Can there be incentivized mechanism where both Arunachal and Assam can cooperate and jointly approach Centre with towards solution options to the issues mentioned?

The challenge of silt transport in the river is a collective responsibility of both Arunachal and Assam. However, dams are not the only solution to this, silt cannot be stopped. Sediment (silt) management is a process, it includes extensive upstream and downstream catchment area management, afforestation

along with structural and non-structural interventions. Another challenge in Brahmaputra is its geological condition and its instability. The priorities towards construction of large dams have been moving and there is also back and forth between minor and medium dams.

Floods equally affect both states, while Assam is seen to have devastation, the people of Arunachal are economically and physically stranded in times of flood. The economic costs on both are high. As deforestations, siltation, landslides are interconnected and feed each other, they need to be managed together by both states.

Q.2. Are there any simple silt trapping devices in any of the tributaries in Arunachal and Assam? Can we think of piloting such simple device in Arunachal and in Assam?

As of now there are no simple devices to trap sediments in Assam as of now. We need to cooperate on this issue Arunachal has not suffered less than Assam, Arunachal is concerned with hydro production but it should also take care of Assam's concerns the joint venture can be done for siltation.

Q3. What are the measures to control the silt and after constrictions of dams, what will be the benefits for the riparian tribes, since river is their life? We had a plan of managing Brahmaputra Hwang-Ho style but there are people who oppose Hwang-Ho style?

We cannot simply transfer solutions to the basin, there is a need for region specific knowledge to inform solutions. Because of the sedimentation it becomes hard to locate the main channel. However, when we talk about sediment management, we can learn from world's major rivers, we need to understand how it's been managed.

Further there is also a need for collaborative management within and across riparian states and countries. There are issues of livelihoods also included in this as people are felling trees for survival but it is contributing to more disasters. Major part of Indian component of Brahmaputra lies in Arunachal. Catchment area treatment and sedimentation both can emanate from Arunachal. There can be multilateral approach towards it; the approach could be scientific and political as well. Can we also work to

cooperate with China in addressing these siltation and development challenges? Could there be power-sharing mechanism/agreements be created between China and India. If china constructs the dams on India we can draw part of that power with an agreement. Similarly we can also construct dams in our part let the china invest and share power? Dialogues can serve as to change views and bring about win-win situations.

Session 2: Realities from the land

Moderator: Ms. Jarjum Ete

- Adv. Vijay Taram and Dr. E. Padung, Community Representatives, Arunachal Pradesh
- Dr. David Gao, Department of Political Science, Rajiv Gandhi University
- Mr. Manik Boruah, Centre for North Eastern Studies and Policy, Guwahati
- Ms. Jarjum Ete, Arunachal Pradesh.

Adv. Vijay Taram, spoke from his experiences as an Anchal Chairperson and also as a member of the Adi Tribe living along river Siang and as person advocating for their rights. He mentioned of the strong bond that the tribe has with the river and how livelihoods are dependent on the land and river. He shared that for an Adi to survive he needs house, land for agriculture, hunting grounds and river to fish. Further, land in Arunachal belongs to the community and Adv. Taram mentioned that the neighboring villages are not willing to donate land for another village to settle. He said that clans and communities own every inch of the land, so it is difficult for people to give up their land, as they think there is little that the government has to offer in terms of adequate land compensation. The issues he reiterated is that the communities living are not willing to sacrifice without due compensation. Building of dams on other tributaries of Brahmaputra is also welcome, however, the location should be such that it doesn't directly submerge communities. Further the cumulative impact of these planned dams are neither studied, nor assessed. This raises technical and environmental concerns on the planned dams. He suggested that the solutions be:

- While a solution to the devastation of floods downstream in Assam is essential, dams cannot be the only option as being suggested.
- Build smaller dams that can cumulatively provide similar amount of electricity and not submerge communities.
- The relationship between people of Assam and people of Arunachal needs to be incrementally built and strengthened before larger cooperation takes place.
- Open and informed discussions and negotiations are needed to arrive at joint decisions.

Political dialogue is very important for the state like Arunachal Pradesh enabling the political will over these issues (transboundary governance) which also very important - Dr. David Gao, Department of Political Science, Rajiv Gandhi University.

Dr. David Gao, spoke from the perspective of hydro-politics of river and dams. He mentioned that the dams discourse was not merely an offshoot of recent political debate. This issue has been under consideration since 1980's. This opposition also stemmed from the lack of information and inclusion within the MoU's that were signed by the Government of Arunachal for dam constructions. Further Dr. Gao stated that these MoUs do not take responsibility for compensation in case the dam breaks. Inclusion of customary tribal laws, cultural importance along with the inclusion of people within decision-making would have paved way for better policies on dams. While a review of the MoU's is required, Dr. Gao also

mentioned that it would also be a challenge as the money for its execution has already been taken. Dr. Gao suggested that just protesting does not assist anyone to accomplish development. Collaborative approach for effective governance requires:

- Integrated water management plans requires inclusion of villages in decision making and also enables future acceptance of execution of plans.
- Building political will is also necessary for execution of plans, it requires political dialogue to be enabled.
- Review of dam projects and redraft MoU's would address its deficiencies.
- Tribal population is high so the issues need to be looked at from a tribal perspective also

Mr. Manik Boruah, spoke from his experiences while working with communities living on the banks of Brahmaputra through the Boat Clinics and through Radio Brahmaputra engagement in the past 10 years on chors (river islands). Communities living in the chors include several tribal and settled communities such as Mishing, Boro, Rava, Rajvanshis, Janelasamis and Bualas, also Nepali communities and Muslim communities referred to as Miuan or Bhatia. These river islands and embankment communities face floods on a regular basis. While floods are seen as a challenge, they are also a blessing. They bring fertile sediments that enable substance farming, it cleanses the river and also provides micro nutriment for the aquatic ecosystems. The region where the three tributaries meet is called Diblusakia, which is not only rich in wetlands but also provides a buffer for floods for the rest of the region. The local communities living in this region have learnt to cope with floods in terms of the houses they build and also in terms of foods they store and their livelihoods. One of the challenges that contributes to increase of erosion is logging of timber in the upstream regions. Further the challenges of global warming is changing patterns of river flows in floods and dry season. Some strategies for mitigation of such problems Mr. Baruah suggested include:

- Socio-economic survey of the region to understand who is living and how are they living in the region.
- Early forecasting and information systems for flood warning to protect lives and
- Dredging is not required on the whole river. There are few channels in Brahmaputra that are used for navigation, the dredging of those channel will be useful to connect river island communities.
- Different government departments view floods and the response to it in different ways. A convergence between departments involved can enhance flood response.
- Rehabilitation or compensation for flood and erosion affected people such as crop insurance mechanism.
- Chors can become special economic zones for organic agriculture value chain. This is because the soil is very fertile and organic produce is easily carried out.

There are no (relief) measures for flood and erosion affected people- one solution is crop insurance for communities in chor regions - Mr. Manik Boruah, C-NES.

Smt. Jarjum Ete, based on her engagement with women and tribal communities across the basin in Arunachal Pradesh mentioned that building common consensus among the people across borders will take time as it will require people to people conversation. The tribal laws Smt. Ete mentioned



dictates that the land belongs to the communities and any development therefore requires community's permission. The MoU's that were signed on the hydro-power dams by the government of Arunachal require review. Smt. Ete also shared that there are also concerns over the lack of transparency in how agreement for developing the river are signed. This also creates distrust. Women in tribal communities are entrusted with land and maintaining its integrity according to tribal laws. They are the ones who are sacrificing the most to maintain integrity of the land and not considered in the process.

"...we can use the water, we need to find the middle path" – Shri. Tomi Ete, Arunachal Pradesh.

Smt. Ete also mentioned that the changing lifestyles are changing the way the river and land is being economically utilized and exploited. There is clash between the tribal perspective of revering nature and modern preference for infrastructure development.

- The process of hydro-power development could progress in an incremental manner, as there are concerns regarding seismic zones, compensation issues, and land-loss. Showing that these concerns can be addressed will provide means to show its sustainability. It would also gradually help in developing confidence.
- Interface with political dialogues at both local and state and national level is required to explore new avenues.
- Government and Community Based Organization's both need to be sensitized. There is also need for community education and sensitization of both, activists on finding avenues for solutions and bureaucracy for understanding sensitivities of communities.

Shri. Tomi Ete, Ex-secretary Water Resource Department Arunachal Pradesh, mentioned that people fear dams due to past experiences. In June 2000, there was a flood in Siang River because of which the water level rose above 13 meters above recorded standard. This high flow of the river caused the bridge present on the river to be washed away. There is uncertainty in the security of infrastructure development on the river that

Community education and bureaucrats sensitization these are the things we need to look at...- Smt. Jarjum Ete, Arunachal Pradesh

is unsettled. These are the reasons people are a little afraid. However, he also pointed out that there is a need to find a middle path. He suggested, constructions of dams on the tributaries could be the middle path. There are even suggestions like construction of

dams (stage I) on upper Siang.

Discussion

Q1. Can there be construction of Dams in such a way that will not harm settlements? What kind of challenges would the government face in taking up this kind of responses?

Response: The past precedents of Narmada and other examples of compensation create challenges. Communities feel that there are no guarantees for effective compensation of lost land. However, there is a need to move ahead beyond the past bitter memories, even between governments of countries and states. There is need for an attitude change and openness for avenues for cooperation. The Central government of India needs to play a very major initiative. Communities living on the riverbanks need to be informed and involved to be active project proponent. Uptake of project should be done that provide equitable benefits to both sides of the borders. We need to identify weakness and take advantage of strengths.

There are humans on one side and biodiversity on the other, a balance needs to be reached, a compromise needs to be done. -Dr. Sanchita Boruah

Session 3: The River and its Ecology

Moderator: Dr. Sanchita Boruah

- Dr. Sanchita Boruah, Dibrugarh Hanumanbax Surajmall Kanoi Colleg
- Mr. Mirza Zulfikur Rahman, Research Scholar, IIT-Guwahati
- Dr. Partha Jyoti Das, Program Head, Water, Climate & Hazard Division at Aaranyak
- Ms. Jayshree Hazarika and Ms. Bandita Barman, Research Scholar, IIT-Guwahati
- Prof. Nishamani Kar, Professor, Dept. of Geography, Rajiv Gandhi University, Arunachal Pradesh

Dr. Sanchita Boruah focused on the biological and ecological aspects of the Brahmaputra River. Flow pattern and catchment are the major factors that influence rivers and streams. Flow regime is of central importance in sustaining the ecological integrity of flowing water systems. The five components of the flow regime i.e. magnitude, frequency, duration, timing, and rate of change influence ecological integrity both directly and indirectly. Also, a river is connected with its catchment in three dimensions: longitudinally, laterally and vertically. Maintenance of natural patterns of longitudinal and lateral connectivity is essential to the viability of populations of many riverine species. Riverine people are dependent on the river for their livelihood (e.g. fishery or agriculture). But because of rampant degradation of the agricultural and forest lands, people are increasingly becoming more dependent on the river (fishery) for sustaining their livelihood.

Further, disturbances like erosion and abrasion, degradation and aggradation play an important role in organizing overall communities and ecosystems.

- Hence it becomes imperative to take into account the eco-hydrology of the river basin before undertaking any kind of developmental projects.
- It is crucial to build alternate skills of these people so as to promote sustainable livelihood practices in the region.



Mr. Mirza Zulfiqur Rahman, shared his experience of working in Arunachal Pradesh where he focused on the aspect of infrastructural development and how the local communities actually perceive these developments. The infrastructural development in Arunachal Pradesh is mainly of road development infrastructures (e.g. highways) and transboundary river interventions. The lack of understanding in the region is a result of absence of trust among the riparian states i.e. Assam and Arunachal Pradesh. The issues of contestation between the two states are more as compared to those between India and China. Quite a number of proposals and MoUs have been signed for the construction of dams in Arunachal Pradesh. As a result, people of both Assam and Bangladesh are concerned about the impact these physical interventions might have. It is crucial to assess the environmental impacts of the developmental projects being undertaken on the Transboundary Rivers. Not much of development has taken place in the region and the construction of dams in the region is being promoted to enhance the overall growth of the people of the region. Despite that, the involvement of the local people in the overall decision making process is mostly low or even absent in most of the cases.

- For sustainable management of the river, it is important to learn lessons from history and the traditional practices of the communities
- It is important to analyse the evolution of the democratic space in India and how the larger developmental concerns of the local people can be accommodated in the overall decision making process.

Dr. Partho Jyoti Das reflected upon the issues of upstream-downstream interaction between the riparian states and countries. Upstream-Downstream issues cover four aspects i.e. intra-state/intra-country and inter-state/inter-national (trans-national) domains. For example, in the Arunachal Pradesh-Assam axis, not only Assam but also a large part of Arunachal Pradesh is the ‘downstream’ part. Whatever happens in upstream regions, inevitably has consequences on the downstream regions. Taking an example of the changes that have taken place in Ranganadi catchment, he explained how changes in hydrological regime can get manifested into different kinds of social, biological, and economical impacts. Because of the various developmental activities, the lean season flow has reduced considerably in the region. It is important that these negative impacts are recognized in order to mitigate them. Further he talked about the India-China relationship and how the process of dealing with the issues need to be changed. The atmosphere between the two countries is full of combination of both facts and myths. Mostly of our available information is obtained through media because of which it is important to gather adequate reliable information before reaching any conclusion.

- Collaboration and cooperation between Upstream-Downstream areas is a must for equitable sharing of benefits of water resources.
- Collaborate with media for effective representation of realities.

Ms. Jayshree Hazarika talked about few of the on-going research activities being carried out in the Brahmaputra Basin. One of the objectives of the Center of Excellence under Civil Engineering Department is to promote hazard free development in the hills. A new concept of optimum ecological management practice has been developed in order to enhance the hazard free carrying capacity of the hills. Further a study at IIT-Guwahati is being carried out to assess the impacts of climate change in the basin. River Bank Modelling and River Bank Protection study is also being carried out using an indigenous river model called BRAHMA which is a combination of hydrodynamic and optimization models. The study shows that the quantitative understanding of the stability of the channels and the ecological impacts of sediment mining and sediment transport mechanism is quite uncertain in the region.

Apart from the contested issue of dams, issues like flood and erosion which are quite rampant in both Assam and Arunachal Pradesh also need to be focused upon.
-Dr. Partha Jyoti Das

- Brahmaputra specific sediment transport model needs to be developed for the investigation of impacts of various activities such as channel dredging, construction of any hydraulic structures etc. on river morphology.
- More collaborative studies should be carried out in the region to promote environmental and ecological friendly development in the region.

Prof. Nishamani Kar, shared his experience of working in both Assam and Arunachal Pradesh. Evacuation and soil erosion are the two major problems which are quite prevalent in Majuli. Moreover the issue of reclamation of new lands still exists in these regions. There are no laws in India according to which the land re-distribution should take place and hence the problem still persists. In the Kamrup district of Assam, according to a micro-level study, floods in the region have created a havoc in the lives of the people and have lead to serious problems of education, health and de-population in the region. In towns like Lakhimpur, the frequency of disasters like urban floods have also increased. Recently early warning systems and hotlines have been developed which have helped in preparing the people well in advance.

Discussion:

Q1: How is the siltation affecting the fauna of the Majguli area and what kind of skill development can be carried for the local communities?

Siltation in the Majuli has engendered the population of dolphins in the region. With the increasing siltation, the overall depth of the river water has decreased. As a result of which the overall fish production in the region has declined considerably. One of the alternative livelihood options for the local people is to opt for different kind of fishery, example: culture or ornamental fishery. Apart from that, people without lands to cultivate have no other option but to resort to daily wages.

Summary and Conclusion

Summarizing the sessions, Ms. Fanaian brought out a few highlights from the day's discussions. The issues were addressed at three levels- it included discussing the *risks* such as floods, that are being faced in the region; the triggers that are causing the risks, deforestation, livelihood issues; followed by the *consequences* that are being faced by communities as a result of these risks and triggers such as erosion, sedimentation. Further *solution options* addressing different points of the risks, triggers and consequences were also shared. Addressing have multiple cross-sections and requires collaboration. For example it was seen that the problem of sediments is not a single problem neither does it have a single solution. It requires, catchment level planning, communities' collaboration in management, alternate livelihood options, infrastructural planning and more.

- Certainty is a challenge in face of ambiguity: Achieving certainty in decisions is difficult in dynamic systems such as Brahmaputra. Defining a best possible approach would require enhancing understanding of the river and its ecology before interventions are placed. Immediate interventions need effective addressal mechanism and research. There was consensus on bringing together these researches and building bridges between research, consultation and action
- Devolve the enemy: The process of effective governance requires consultation that moves contentious issues into maybe model or pinned aside so that deliberations move towards solutions options for the betterment of the region. Next discussion can look at alternate mechanisms to address this.
- Talk-listen-consult-reflect: This iterative non-linear process requires awareness, building local consensus and people to people communication. Media plays a key role in breaking myths.
- Subsistence livelihoods alternatives: Vulnerable groups and women among them living on banks of the river are dependent on the river and require skill development to addressing livelihoods challenges. There is also need for alternatives to be created to enable survival during floods, avoid damage to the river ecosystem and provide opportunities for growth within the region. Alternate livelihoods skills and options being need to be mainstreamed and brought onboard. Need to start looking towards solution options.

The purpose of this platform was reiterated which is to provide a space to build joint ideas, enhance awareness, build people to people, people to government connections. The platform also seeks to change mindset, serve as a multiplier effect to carry forward collaboration, dispel myths and break silos between understanding and research. This will continue to provide spaces for learning. However such efforts will be materialized as we start to integrate learning, build understanding, share and urge each other towards a more collaborative approach for river governance.

The ultimate goal is to enable inclusive and sustainable governance of Brahmaputra River, to make it an exemplary system that can serve as a learning site for others.

Day 3: Field trip Gerukamukh Subansiri lower Hydro-electric Power Plant

To convert the information gathered during the two days of the workshop into an understanding of the reality, a field trip to Gerukamukh Subansiri lower Hydro-electric Power Plant was held on 22nd November 2016. Construction of this 2000 MW Subansiri Lower Hydroelectric Project (SLEP) at the Gerukamukh of Assam-Arunachal border has been stalled since 2011 owing to the opposition from various groups. The field trip was attended by academicians, Civil Society Organisations (CSOs) and media representatives and aimed at visiting the dam site to interact with the National Hydro-Power Commission (NHPC) officials in order to understand the issue in a much better way. The participants of the field trip were taken to the different parts of the dam construction site and the discussion with the NHPC officials highlighted the various aspects of the dam construction and the controversy prevailing around it.



regarding the safety of the structure and claimed that the project will not only help in the reduction of the havoc caused by floods every year in Assam but would also help in overcoming the power shortage faced by the people in the region. If completed, the project, which is usually described as run-of-the-river project by NHPC, will be the highest hydroelectric project in India.

Much of the opposition, from the local communities, centers on the issue of seismic safety and the amount of water that would be released after the construction of the dam. Localities living downstream of the river are also worried about the impact it will have on their livelihood activities like fishery and agriculture. The NHPC officials maintained their stand