

Policy Brief

Hopes of endurance in the hinterland of risk:

Life in the islands of the Brahmaputra River, Assam



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This Policy Brief has been developed out of the findings and learning from the study 'Community resilience to water induced disasters and climate change: A study and documentation of good practices in selected river islands of the Brahmaputra River Basin, Assam' carried out by Aaranyak (Guwahati, Assam) in 2019 with support from the India Water Partnership (Gurugram, Haryana)

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Policy Brief

Hopes of endurance in the hinterland of risk: Life in the islands of the Brahmaputra River, Assam

1. Chars in the Brahmaputra River, Assam: Living in the land-water interface

The Brahmaputra River is one of the large river systems of the world, fifth largest in terms of average discharge ($20,000 \text{ m}^3\text{s}^{-1}$)¹, 22nd longest (2880 km) (Sarma, 2005) and second highest in sediment load with 804 million tons/km² at Pandu, Assam and 1128 million tons/km² at Bahadurabad, Bangladesh (Goswami and Das, 2003). Originating at the Angsi glacier in Burang County in Tibetan Autonomous Region of China at an elevation of about 5300 meter, where it is known as the Yarlung Zangbo or Tsangpo, the river traverses 1,625 km in China, 918 km in India, and 337 km in Bangladesh. The River, during its majestic journey from the 'Roof of the world' (Qinghai-Tibet Plateau) to the deltaic lowland in Bangladesh, passes through very different topography, climate and landscapes nurturing diverse ecosystems, habitats, human societies and cultures.

The entire length of about 800 km of the Brahmaputra River and some of its tributaries in Assam are dotted with numerous islands (locally called char and chapori) of different sizes and shapes. Many of these islands are permanently inhabited, some temporarily and some are barren. Being completely controlled by the river's geomorphological and ecohydrological characteristics and the seasonal cycles of flooding, erosion and channel migration, the chars are in a state of physical change round the year due to aggradation and denudation.

2. Communities, demography and socioeconomy:

The chars of western and central Assam are peopled mainly by immigrant Bengali speaking Muslim community, the forefathers of whom migrated from the erstwhile East Bengal of British India during the eighteenth, nineteenth and twentieth century, (Sultan, 2015). The agricultural practices and other socio-cultural traits of different char areas peopled by this community bear considerable similarity within Assam and also to those seen in the chars of Bangladesh.

In the islands of central and eastern Assam, some other indigenous communities like Misings and Deuris as well as other settlers like Nepalis and Biharis also live. Majuli, the largest inhabited river island of the world, located in the eastern stretch of the Brahmaputra is an exceptional case where a large population of indigenous ethnic groups live permanently, which has become possible because of its geomorphic stability providing fertile soil and a congenial environment with many natural resources that supported livelihoods and progress of societies aided by the fact that the island became the centre of the Neo-Vaishnavite faith and culture² from sixteenth century. This is also a reason why people of Majuli are relatively more literate than those living in other river islands as reflected in Table 1.

3. Why are the chars important for Assam?

The chars and char dwellers play a very important role in the agricultural and economic development of the state. The chars have become the granaries of the entire state since a sizeable amount of

¹ <https://waterresources.assam.gov.in/portlet-innerpage/brahmaputra-river-system>(Accessed on 04.02.2021)

² Propagated by Mahapurusha Srimanta Sankar Deva(1449-1568), the Great 15th-16th Century Saint, Scholar and socio-religious reformer of Assam which resulted in a socio-cultural-literary renaissance. Majuli became the repository of this New Vaishnavism tradition, Assamese culture and a potential heritage site.

kharif and rabi crops (paddy and seasonal vegetables, for example) are produced in the chars (Chakraborty, 2009). The char community has earned a good name as hard workers and innovative as far as agricultural production is concerned. They make it possible to grow all types of crops and vegetables in environmentally hostile conditions even on heavily silted and sandy soil. Soils of similar nature are considered as wastelands and therefore unproductive, in the main land by many indigenous communities. This has become possible because farmers in the islands are also more adaptive to the drastic and seasonally changing aquatic environment, rivers and water than many of the mainland communities (Das and Lahkar, 2012).

Box 1: Demographic and socioeconomic information about the Assam chars

The last socioeconomic survey results published by Government of Assam in the year 2004, revealed that the state had about 360,000 hectares (3600 square kms) of charland, which was about 4.5% of the geographical area of the state, where about 2.5 million (25 lakh) people lived (DCAD, 2004). Out of this population, 1.27 million are male and 1.23 million are female. The Char areas were distributed in 2251 villages in 299 Gaon Panchayats belonging to 23 Administrative Sub-Divisions and 59 Development Blocks falling under 14 Districts. The total number of families was 0.44 million (about 4.4 lakhs) of which about 68% lived below the poverty line. Density of population in Char areas, e.g. 690/sq. km at that time was much higher than average density in the State which was 340/sq. km (GoA, 2005). About 81% of the males and 92% of females in chars of the state were illiterate (DCAD, 2004).

4. Context of the Policy Brief

This policy brief has been developed based on a study entitled '**Community resilience to water induced disasters and climate change: A study and documentation of good practices in selected river islands of the Brahmaputra River Basin, Assam**' commissioned by India Water Partnership and undertaken by Aaranyak in 2019. The study was conducted in thirteen villages located in three populous river islands of the Brahmaputra viz. Chalakura Char (Seven villages), Dhubri District; Salmora Mouza (Two villages), Majuli District and Kobu Chapori (Four villages), Dhemaji District. The study mainly (i) analysed the factors that are responsible for making the people vulnerable to water hazards and climate change and (ii) examined the practices and strategies adopted by them to be able to live in extremely adverse conditions in the existing physical, environmental and socioeconomics contexts. The study has led to major findings that are applicable to the three study sites in particular and all char areas in the Brahmaputra flood plain in general. Salient recommendations, both for the studied chars as well as for riverine islands of the state in toto have been provided for effective disaster risk reduction (DRR), climate change adaptation (CCA) and inclusive sustainable development.

Primary research methods were deployed for generating empirical information using PRA (Participatory Rural Appraisal) techniques such as focus group discussion, key informant interview, participatory landscape and resource mapping, transect walk, historical timeline etc. Secondary data was collected from standard sources (scientific papers, reports, books, grey literature). Geospatial technology (satellite data, remote sensing, GIS, GPS) was used for landscape analysis.

Table 1. Demographic Information of the three study sites

Site Name	Villages	Area (Ha)	Number of Household	Population	Literacy (%)
(1) Chalakura Char Panchayat: Chalakura Development Block: Birshingjarua Revenue Circle: Dhubri District: Dhubri	(i) Chalakura Part I	173.1	120	740	0.95
	(ii) Chalakura Part II	250.4	313	2005	13.22
	(iii) Chalakura Part III	345.7	113	630	20.79
	(iv) Chalakura Part IV	217	288	1696	25.53
	(v) Chalakura Part V	178.1	381	1710	16.84
	(vi) Chalakura Poyesti Char	391.7	420	728	73.76
	(vii) Sialmari	280.4	102	815	23.44
	(viii) Birshing Sialmari	190.8	0	0	0
	Total	2027.2	1737	8324	22.25
(2) Salmora, Majuli Panchayat: Bongaon Development Block: Kamalabari Revenue Circle: Majuli District: Majuli	(i) Kamjan Alengi	384.46	208	965	81.83
	(ii) Borboka Pathar	254	309	1444	79.89
	Total	638.46	517	2409	72.72
(3) Kobu Chapori Panchayat: Silley Development Block: Murkongselek Circle: Jonai District: Dhemaji	(i) No 1 Kobu Chapori	1675	86	455	34.47
	(ii) No 2 Kobu Chapori	1860	123	527	29.60
	(iii) No 3 Kobu Chapori	1765	167	800	31.00
	(iv) No 4 Kobu Chapori	2000	278	1596	34.18
	Total	7300	654	3378	32.64

5. Increasing impact of water hazards and climate change

Assam is the most climatically vulnerable among all the 12 Indian Himalayan Region states (DST, 2018). Melting and retreating of glaciers in the Himalayan and Trans-Himalayan Tibetan region and changing monsoonal rainfall are likely to have caused alterations in the hydrological regime of the Brahmaputra river system which is fed by both rainfall and snowmelt run-off (Mitra and Das, 2016). Projected increase in rainfall and accelerated summer flows may give rise to more intense flooding initially, but consequent retreat of glaciers may reduce flows in the long run, threatening the food security of the basin population Immerzeel *et al.* (2010).

The river islands suffer from a plethora of water and climate induced hazards such as floods, riverbank erosion, land degradation due to sedimentation and sand casting on riverbanks and farmland being the major ones. The manifestation of climate change impact is observed in the Brahmaputra River Basin in Assam (BRBA) as intensified and increased frequency of water induced hazards (Das, 2009; Das, 2018). The erratic and uncertain rains, warmer temperatures, lengthening of the monsoon season, shrinkage of the winter months, increase in extreme (heavy) rainfall (e.g. cloud burst) and flash flooding, rising incidence of drought like situation, dust storms as well as ecological changes affecting forests, wetlands and biodiversity are other indicators of climate change noted in these islands.

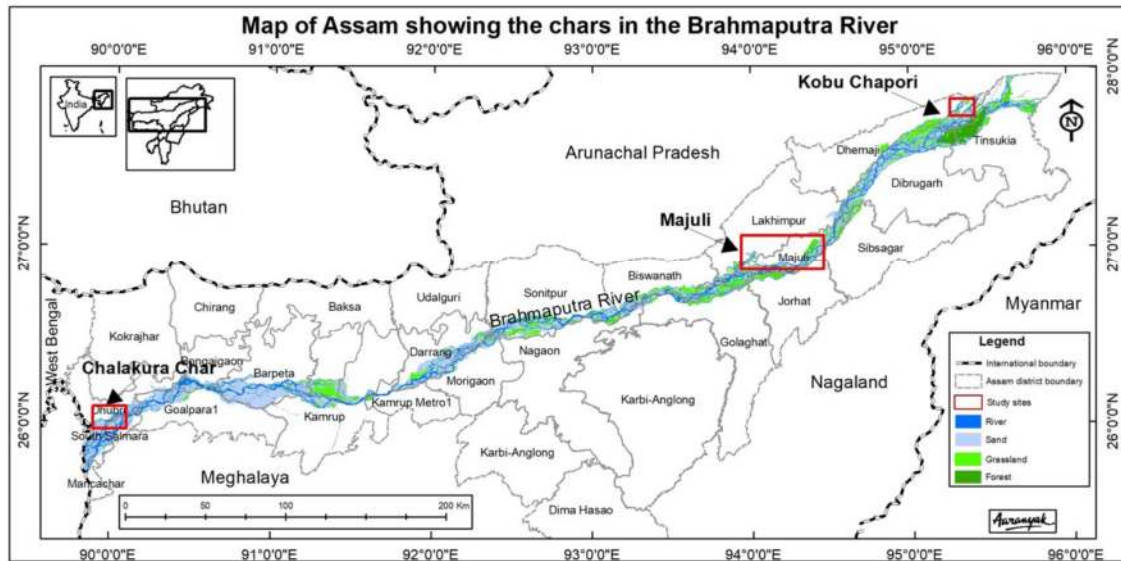


Figure 1: Location of the three study sites in the Brahmaputra River, Assam

6. Life on the edge of extreme risk

Lives of the island dwellers are overwhelmingly dependent on ecosystem services of rivers and riverine ecosystems (Karim *et al.*, 2015). Their life cycle and livelihoods are tuned to the seasonal rhythm of the monsoons and the hydrological response of rivers to monsoonal rainfall and other geomorphic and ecohydrological changes in the river regime. Being so overwhelmingly dependent on and influenced by hydroclimatic factors for sustenance is a primary reason of their high vulnerability, which is increasing all the more due to the observed and predicted consequences of climate change.

The climate induced risks are causing abysmal lowering of socioeconomic conditions of people sucking people into an annually renewing poverty trap leading to insecurity of shelter, food, nutrition and livelihood. Health hazards mainly due to poor WASH (Water, Sanitation, Health and Hygiene) situation, lack of medical facilities and poor awareness about good health have further reduced human security precipitating an overall degeneration of dignity of life with women and children being maximally affected.

7. Resilience: Not a choice, but a compulsion

Despite being hotspots of hazards and risk, the chars are known as centers of agricultural revolution. The people exhibit remarkable examples of adaptive capacity to the impact of water hazards and climate change, which is the result of their do or die struggle to survive and flourish in extremely adverse living conditions. Living in stilted houses, cultivating water and sand adapted crops, large scale Kharif farming, using riverine resources for income generation, and resorting to non-firm livelihoods are novel examples of their adaptive skill. The remarkable resilience they exhibit is worth examining so that other communities can learn from them to make survival possible and sustainable in vulnerable locations.

8. Key Findings: Physical Vulnerability

- The river islands are highly disaster prone areas of Assam not only because of direct exposure to the river's water front, but also due to increasing intensity and frequency of the water induced hazards under a changing climate. The hydroclimatic disasters have become erratic in nature making it deviant from their long-term normal behaviour pattern.
- Vulnerability of the island dwellers depends on a complex combination of factors like physical exposure to hazards, intensity and frequency of hazards, socioeconomic conditions such as awareness, literacy, education, health, hygiene, drinking water; nature of livelihoods, poverty, energy security, ethnic cultural norms, social network and support system and governance (Government's policies, programs and institutions) etc.
- Shifting river courses of the Brahmaputra and the aggradation-denudation processes of the islands determine the history of settlement of the community in the case of most chars.
- Among the common water induced hazards, erosion is the biggest source of threat to habitats and lives of the communities who find flood easier to cope with than erosion since erosion causes long-term or permanent loss of land to the river.

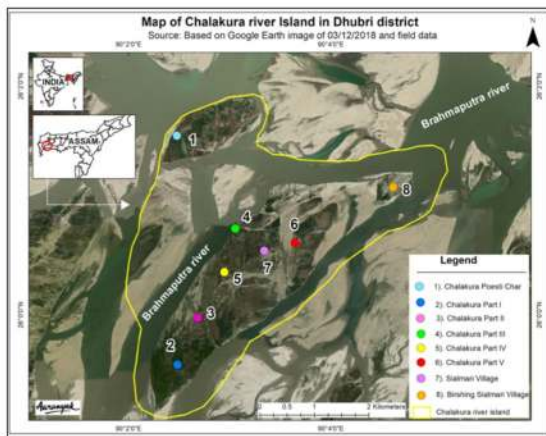


Figure 2: Chalakura Char, Dhubri District

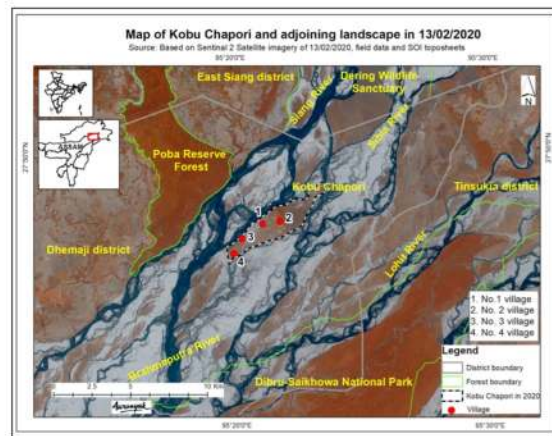


Figure 3: Kobu Chapori, Dhemaji District



Figure 4: Borboka Pathar and the Kamjan Alengi villages of Salmora Mouza, Majuli District

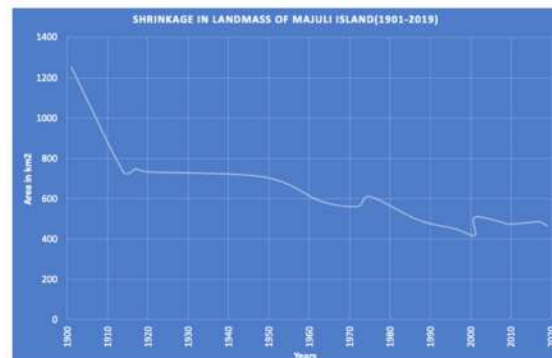


Figure 5: Trend in loss of area of Majuli island

Box 2: Shrinkage of habitable area: The gravest threat to human existence

The Chalakura Char, that constitutes the entire Chalakura Gram Panchayat has lost an area of approximately 803 km² in the last five years, during 2014-2018. During this period the land area suitable for human habitat has shrunk from 6.25% to 3% in the char while area under sand deposition increased by 10% and most of the water bodies disappeared (from 2.68% to 0.53%).

The mainland mass of Majuli has progressively decreased from 497 km² in 1987 to 478 km² in 1999 to 476 km² in 2009 to 468 km² in 2019, thus shedding about 29 km² in 32 years (1987-2019). Out of this, net loss in agricultural land is 9.25 km² (81.83% in 1987 to 72.58% in 2019).

The Brahmaputra moved northward by about 3 km in eating up almost the entire Salmora area with only one third of its original area existing now. Most of the families living in the study villages as well as in some other nearby riverbank areas have shifted their houses at least 6 to 7 times in the last three decades. The original locations of the two study villages are already under water.

The Kobu Chapori which was about 91.35 km² in 1977 has been reduced merely to about 10.85 km² in 2019 indicating a loss of about 80.5 km² which is about 88.1% of its landmass in 1977.

9. Key Findings: Socioeconomic vulnerability

- Dependence on climate and water dependent livelihoods such as agriculture, pisciculture, animal husbandry is a main source of vulnerability for the island dwellers.
- Low rate of literacy, poor socioeconomic condition resulting in poverty, lack of development infrastructure such as drinking water, health, sanitation, hygiene and nutrition and overall marginalization due to remoteness from the mainland are the factors that make them all the more vulnerable to the hazards.
- Communities generally do not have the collective voice and action that is necessary to compel the Government machinery to act and deliver benefits to the people through regular welfare schemes without bias and financial corruption.
- People have become landless and homeless compelling them to migrate and deal with consequent conflict over land and other resources. Labour outmigration, mainly of young males to all over India, although considered as an adaptation strategy, has led to social crises like gender insecurity.
- The all-pervading impact of climate change in conjunction with flawed policies of disaster management and eco-hydrologically insensitive development programs have caused grave threats to the physical existence of these islands and unprecedented human suffering for the poor and marginalised sections. Many Vaishnavite Satras (monasteries) have been eroded away by the river requiring shifting of some of them to various other places both within and outside the islands which has affected its cultural legacy.

10. Key Findings: Many facets of Resilience

- Survival and sustenance including livelihood activities in char areas are, in general, tuned to the seasonal rhythm of rivers, weather, climate and river hydrology, especially with respect to the Southwest Monsoon. For the char people, successful adaptation to the changing weather and climate patterns is a precondition for survival.
- Many activities related to livelihood, economy, society and culture of the people are determined by the efficacy of the physical and structural security from riverine disasters. Their adaptive decision making both at household and collective levels are significantly influenced by how secure they feel from flood and erosion.
- Ability to produce crops in sandy soil, locally modified crop calendar, experimentation with different farming techniques are hallmark of agricultural practices of people living in char areas which help them adjust continuously to changing climatic situations.
- Labour outmigration, especially of young males to outside destinations both within Assam and outside the state is a common trend in all char areas which is considered as a good strategy since the remittance from the migrants helps families in reducing risk and adopting adaptive measures. But at the same time it generates social crises like lack of manpower for agriculture and gender insecurity.
- Some of the traditional coping and adaptation strategies have become less effective at present due to the changing nature of local climate and natural hazards. Many of their predictive ideas about weather and river behaviour conceived out of their observational experience and skill do not hold good anymore. Therefore, communities are in need of external support to adapt successfully to the changing environmental, climatic and socioeconomic conditions affecting their habitats and lives.

Table 2. Resilience Regime: An Overview

Aspect of Adaptation	Autonomous and Planned Adaptation: Strategy and Practices
Physical attributes	Skill in swimming, plying boats and banana rafts, collection of driftwood, survival with little food in hard weather conditions, capability of doing hard manual labour
Mental and Psychological attribute	Mental toughness; quality of adjusting psychologically to disadvantageous situations; Determination to survive and flourish amidst calamity and adversity
Preparedness	Storing food, water, medicine, fuelwood, fodder, boat and cash money; formation of volunteer groups with local villagers for emergency help to people;
Housing	Living in stilted houses, houses with elevated foundation, houses on high ground and raised platforms inside house for flood proofing, use of collapsible material and design in house making
Community action	Tree plantation and installation of bamboo porcupine to reduce erosion.

Aspect of Adaptation	Autonomous and Planned Adaptation: Strategy and Practices
Social	Internal social support: Help to one another in times of distress and need, for example, during post-disaster rebuilding and rehabilitation; Support from grassroots agencies like Village Defence Party (VDP) in rescue, relief and rehabilitation work;
Livelihood-Agriculture	Innovative methods of agriculture such as adaptive crop calendar and mixed cropping for risk distribution; Large-scale adoption of boro paddy; jute and sericulture; Emphasis on Rabi crop; fish catching, firewood collection from river; Seed preservation at household and community levels.
Water adapted livelihood	Efficient use of river borne resources for livelihoods: Fishing, boating for passenger transportation, driftwood collection, traditional pottery, boat making;
Non-farm livelihood	Weaving; carpentry; daily wage earning outside char area; Outmigration to nearby districts of Assam and other states of the country for employment and small business
WASH	Use of sanitary toilets, sanitary napkins by women; Benefit from Health Card, services from boat-borne health care facility (boat clinics).
DRR infrastructure and programs	Measures of flood containment and riverbank protection: Construction of spurs and embankments; Laying of RCC porcupines and geobags (only in case of Majuli)
Cultural	Religious and spiritual faith that imbibe courage and strength in people to fight with calamities for survival and sustenance; Use of local knowledge for anticipating time and nature of disaster
Gender	Women's proactive role in livelihood and income generating activities such as agriculture, horticulture, weaving, sewing, production of jute items.
Development infrastructure and programs	Construction of village road and elevated platform through MGNREGA schemes; Construction of raised tube wells and toilets; Pension to the elderly; free education to students; electricity supply (conventional & solar) <i>etc.</i>

11. Key Findings: Policy Gaps

- There is no up-to-date and currently relevant demographic and socioeconomic information available about the chars of Assam. The existing information (Box-1) is about 16 years old and does not reflect the ground realities of these frequently changing habitats and societies.
- Although the chars harbour a large and burgeoning human population that labours hard to enrich the state's agricultural production in hostile conditions, they are steeped in socioeconomic backwardness and therefore need wholesome attention of the state for their upliftment. However, these hinterlands and societies are yet to receive the priority they deserve in the development agenda of the state.

- Most of the charlands, barring a few, are bereft of structural and non-structural disaster management measures. Where such protection is available, like in the case of Majuli, the structures (such as embankments, spurs³, RCC-porcupines⁴ etc.) are inadequate and not effective to the desired extent because of poor implementation.

Table 3. Salient Recommendations

Recommendations	Agencies concerned	Intended outcome for resilience
Treat the river islands and their people as a special case for development pursuit and prepare specific policies and action plan to reduce their risk of disaster and climate change with utmost priority.	Department of Planning and Development, GoA; State Transformation and Innovation Ayog (SITA), GoA; NITI Ayog, Gol; Directorate of Char Areas Development (DCAD), GoA; NGOs	Riverine islands will get priority in development agenda
Hold a comprehensive census on population as well as socioeconomic, livelihood and environmental status of the chars.	Directorate of Char Areas Development (DCAD), GoA; Panchayat & Rural Development Department (P&RD), GoA;	Up-to-date information and data on char population which is useful for identifying vulnerability and planning for development
Sensitize char communities about the existing Government programs and policies through awareness campaign and provide support to get maximum benefits from the same.	Directorate of Char Areas Development (DCAD), GoA; Panchayat & Rural Development Department (P&RD), GoA; NGOs;	Optimum benefit to people from Government's welfare and development schemes;
Provide early warning of floods with a lead time of at least 6 hours involving community network in dissemination recommended for all such riverine islands.	Water Resources Department (WRD), GoA; Assam State Disaster Management Authority (ASDMA), GoA; National Disaster Management Authority (NDMA), Gol	Resilience to floods through preparedness
Implement women-specific programs, designed especially for chars, focusing on health, menstrual hygiene, nutrition and child care; livelihood, participation in planning and decision making in DRR, CCA and development activities.	Health & Family Welfare Department (H&FW), GoA; National Health Mission (NHM), GoA; Directorate of Char Areas Development (DCAD), GoA; Assam State Disaster Management Authority (ASDMA), GoA; Panchayat & Rural Development Department (P&RD), GoA	Better health of women and children; Inclusion in development planning and implementation, Overall women empowerment;

³ Spur: A spur, spur dyke, or groyne is a structure made to project flow from a riverbank into a stream or river with the aim of deflecting the flow away from the side of the river on which the groyne is built.

⁴ RCC Porcupine: Porcupines are a form of permeable structure designed to reduce flow and trap sediment. They have pole-like projections in all directions, resembling a porcupine with its quills sticking into the air. They are used as flood control structures, and for riverbank and bed protection. Porcupines made reinforced cement are a common riverbank protection measure (Shrestha *et al.*, 2021).

Recommendations	Agencies concerned	Intended outcome for resilience
Expand services of mobile boat-based healthcare units such as the Boat Clinics operated by the National Health Mission, GoA to all remote char areas	Health & Family Welfare Department (H&FW), GoA; National Health Mission (NHM), GoA; Directorate of Char Areas Development (DCAD), GoA;	Better access of char dwellers to health care services
Extend conventional electricity supply schemes to all those islands where it is technically and financially feasible, e.g. islands located close to the mainland	Department of Power, GoA; Assam Power Distribution Corporation Limited (APDCL), GoA; Directorate of Char Areas Development (DCAD), GoA;	Improved energy security; More effective DRR
Provide facilities of solar energy sources, at subsidized prices in remotely situated chars where grid-connected supply is not feasible.	Ministry of New and Renewable Energy (MNRE), Gol; Indian Renewable Energy Development Agency Limited (IREDA), Gol Assam Energy Development Agency (AEDA), GoA;	Climate change mitigation through use of green energy; Improved energy security;
Provide cost-effective technology for preservation of seed, vegetables, crops and food during the flood time.	Agriculture Department, GoA; Assam State Rural Livelihood Mission (ASRLM), GoA; Directorate of Char Areas Development (DCAD), GoA; Panchayat & Rural Development Department (P&RD), GoA.	Assurance of food security and maintenance of livelihoods during time of disaster
Revise the State Action Plan of Climate Change (SAPCC) of Assam and incorporate special chapter on vulnerability of riverine islands and their inhabitants with provision of specific measures for resilience building of flood plain dwellers of the state	Department of Environment & Forest, GoA; Assam Climate Change Management Society (ACCMS), GoA;	Policy and action program formulated for disaster risk reduction and climate change adaptation, especially for char population and floodplain dwellers in general
Improve navigability of riverine routes for boats (which is the lifeline of connectivity for char people) by periodic maintenance dredging where required.	Inland Water Transport (IWT) Department, GoA; Indian Waterways Development Authority	Better navigable riverine routes for boat services, both private and public;

Recommendations	Agencies concerned	Intended outcome for resilience
Connect all major chars with mainland and with one another by commissioning small mechanised boats for transporting passenger and goods providing for required safety measures	Inland Waterways Authority of India (IWAI), Gol; Inland Water Transport (IWT) Department, GoA; Water Resources Department (WRD), GoA	Improved riverine connectivity; Better and safe riverine transport;
Assess all Government programs being undertaken in the river islands from the SDG perspectives; Ensure that all SDGs relevant for the riverine populations are achieved in a time bound manner.	The Centre for Sustainable Development Goals (C-SDGs), GoA; NITI Ayog, Gol.	Achievement of SDGs in river islands; More development benefits to char areas ensuring ecological, economic and social sustainability.
Make registration of the migrant labourers going out of the state (including the char areas) and create a data base	Panchayat & Rural Development Department (P&RD), GoA; Directorate of Char Areas Development (DCAD), GoA.	Maintenance of records and creation & updation of data base on labour outmigration will help in identification of migrant households for providing social support in case of need.

Note:: GoA: Government of Assam; Gol: Government of India

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ORGANISATIONS



IWP is a non-profit organisation, accredited with the Global Water Partnership (GWP), Stockholm. India Water Partnership is a country water partnership of GWP. IWP works towards water security in India by following the concept of Integrated Water Resources Management (IWRM). It engages in a dispassionate analysis of various water-related issues and steers the policy discourse on social, economic, and ecological issues on a scientific basis.



www.aaranyak.org

Established in the year 1989, Aaranyak is a frontline environmental organization of India in the non-Government sector. Based at Guwahati (Assam), Aaranyak works all over the Eastern Himalayan Region on nature conservation (focusing mainly on conservation of wildlife and biodiversity), rural livelihoods, natural resources management, climate change, water governance, disaster risk mitigation, sustainable development and environmental law and policy. It works both in program and project mode through education, research, advocacy and development intervention.

Aaranyak is recognized as a Scientific and Industrial Research Organisation (SIRO) since 2007 by the Department of Scientific and Industrial Research (DSIR), Government of India. It has won a number of state, national and international awards such as the Indira Gandhi Paryavaran Puraskar for the year 2012 from the Ministry of Environment, Forest and Climate Change, Government of India; the 'Sansad Adarsha Gram Yojana- Good Practices Award' in 2015 from the Ministry of Rural Development, Government of India; and the State Science Award from Assam Government as the best scientific institution contributing to research and education.

The 'Community-Based Flood Early Warning System (CB-FEWS) implemented by Aaranyak in Assam jointly with the International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal won the prestigious Lighthouse Activity Award in 2014 from the United Nations Framework Convention on Climate Change (UNFCCC), Bonn, Germany under its Momentum for Change Initiative as a best practice in climate change adaptation using Information and Communication Technology (ICT).



Focus Group Discussion with communities

LAYOUT & DESIGN

Media Production & Communications Division, Aaranyak

Dr. Partha Jyoti Das

Dr. Partha Jyoti Das is an environmental scientist having more than twenty years of research experience on issues related to water-climate-risk-development nexus in the context of northeast India. He works in inter-disciplinary interface of natural sciences, environmental sciences and social sciences. He engages with communities, Civil Society Organisations (CSO)s, professional institutions as well as Government agencies through research, education and policy advocacy. He has spoken and written regularly on various aspects of his research leading to more than 200 presentations in local, national and international fora as well as 40 publications. Dr. Das is a member of the Steering Committee of the 'Forum for Policy Dialogue on Water Conflicts in India'. He also served as a member of the 'Expert Committee constituted by the Government of Assam for the rejuvenation of the River Kolong, Assam'. Presently he is heading the 'Water, Climate and Hazard Division' of Aaranyak, a premier environmental NGO of Northeast India.

Dr. Veena Khanduri

Dr. Veena Khanduri holds a Doctorate in Environmental Biology from Forest Research Institute, Dehradun, India. She has more than 32 years of experience in Project Appraisal, Implementation, Monitoring & Evaluation of Projects in thematic areas like water, livelihood and food security, economic & social development, women empowerment, microfinance, rural & urban sanitation, natural resource management, climate change, forestry & watershed management. She has participated in more than 300 workshops, conferences, seminars and meetings organized by various national and international organizations on different aspects ranging from policy dialogues on water & climate change, WASH, strategic issues to regional strategy development. She is the author/co-author of more than 40 scientific journals and media articles, policy briefs. She is a member of more than 10 professional societies. Currently, she is leading India Water Partnership in the capacity of Executive Secretary-cum-Country Coordinator.

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