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CLIMATE CHANGE AND ITS IMPACT ON WATER SECTOR IN INDIA: A CASE STUDY OF MEGHALAYA

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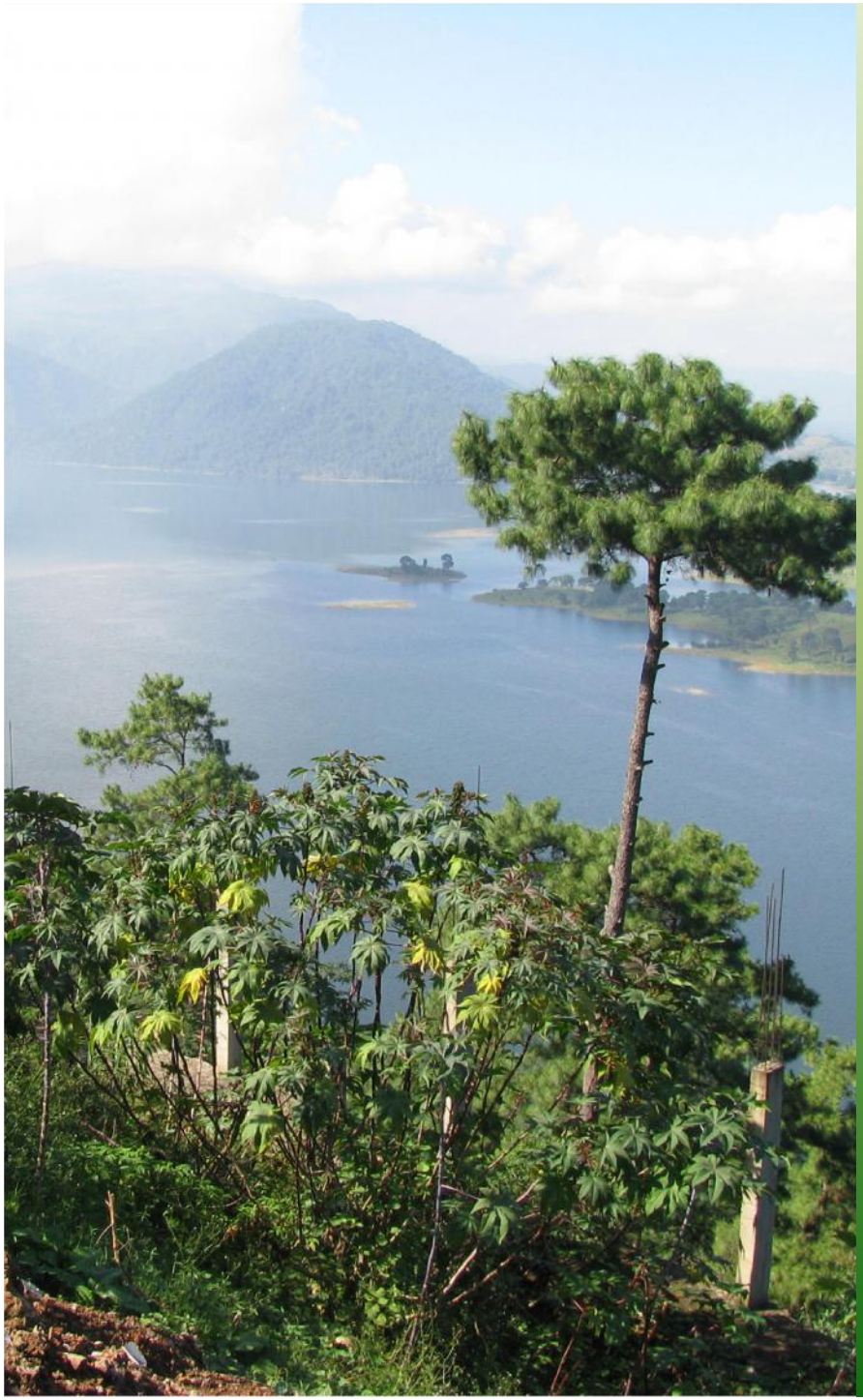
INDIA'S ECOLOGICAL PROFILE

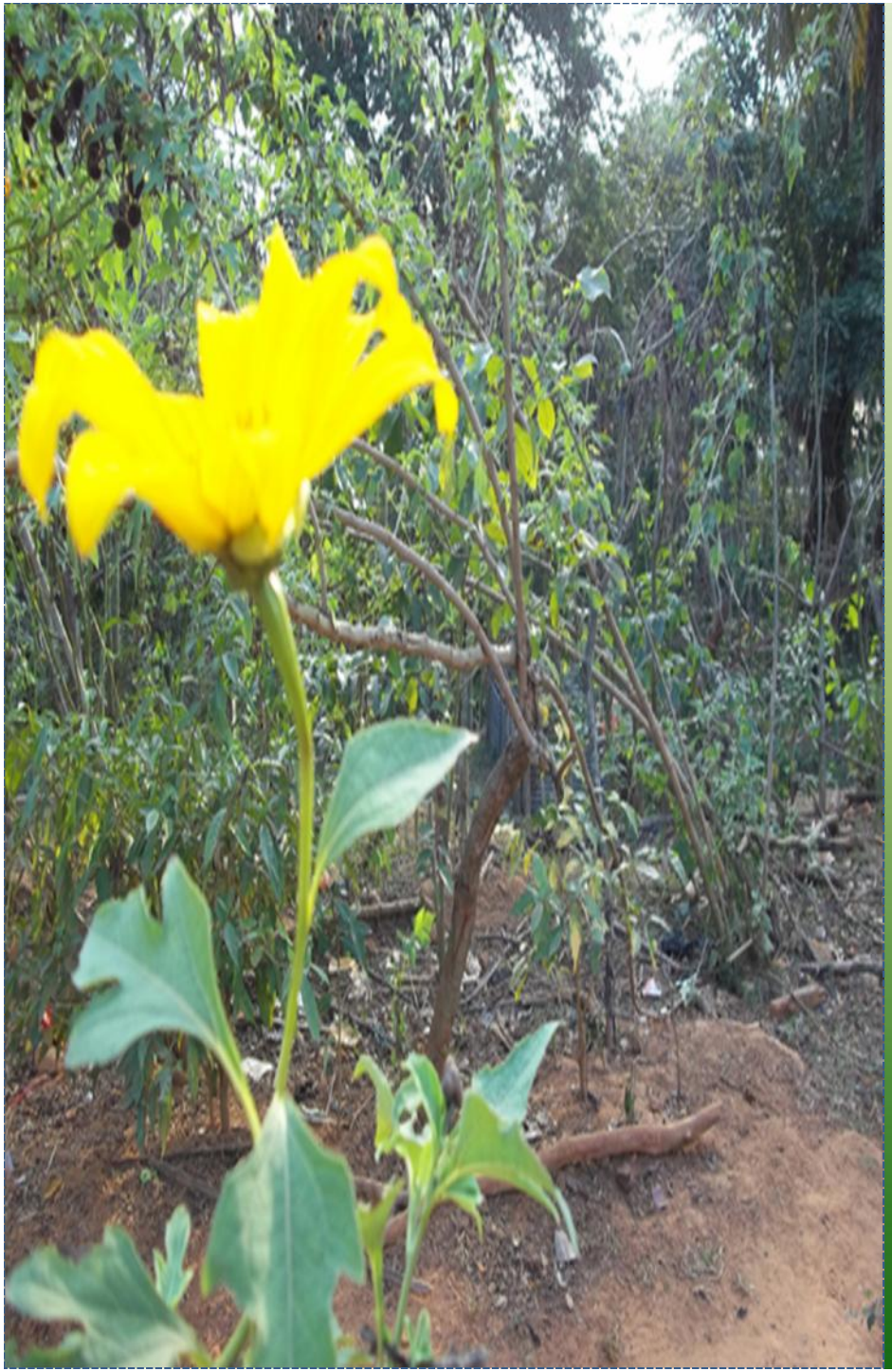
- India has only 2.4% of the world's landmass, 4% of the total water resource, 8.1% of the world's biodiversity, 16% of the world's human as well as 18% of the world's cattle population.
- Topographical constraints envisage uneven distribution of precipitation, varying from 100 mm in western Rajasthan to over 11,000 mm at Cherrapunji in Meghalaya.
- The availability from surface water and replenishable groundwater is estimated at 1,869km^3, but only about 1,123km^3, 690km^3 from surface water and 433km^3 from groundwater resources, can be put to beneficial use.
- Of the total the geographical area of India, 12% is flood-prone and 16% is drought prone.
- The burgeoning population, rapid urbanization and industrialization has affected the per capita availability of water, which has decreased from 5,177 cubic meters per year (m3/year) in 1951 to 1,654m3/year in 2007 and is likely to be as low as about 1,140 m3/yr in 2050.



The ***National Water Mission***, a part of the National Action Plan on Climate Change (unveiled in June 2008), identifies the threat to water resources in India due to climate change in terms of the expected decline in the glaciers and snowfields in the Himalayas; increased drought-like situations, increased flood events; effect on groundwater quality; and influence on groundwater recharge due to changes in precipitation and evapotranspiration.

CLIMATE CHANGE -WATER NEXUS

- Water is the primary medium through which climate change influences Earth's ecosystem and thus the livelihood and well-being of societies.
- Variations in climate change affect availability and distribution of rainfall, snowmelt, river flows and groundwater, and further deteriorate water quality.
- Inadequate management of water resources can jeopardize progress on poverty reduction and sustainable development in all economic, social and environmental dimensions.
- Adaptation to climate change is closely linked to water and its role in sustainable development. Essential adaptation measures that deal with climate variability and build upon existing land and water management practices have the potential to create resilience to climate change, enhance water security and contribute to development.



According to UN Water, significant policy shifts should be guided by the following principles:

- Mainstream adaptations within the broader development context;
- Strengthen governance and improve water management;
- Build long-term resilience through stronger institutions;
- Invest in cost-effective and adaptive water management as well as technology transfer;
- Local-to-global collaboration among sectoral and multisectoral institutions;
- Adaptation strategies required at the local, regional, national and global level.

CLIMATE CHANGE AND WATER IN NORTH-EAST INDIA

- The North East region of India, comprising eight states, covers a geographic area of 26.2 mha and a population of 40 million.

- The region has distinct climate variations. The rapid changes in topography result in climate changes within short distances.

- It is vulnerable to water-induced disasters, fragile geo-environmental setting and economic under-development.

- The abundant water resources flowing through the Brahmaputra and Barak rivers imposes severe distress and costs on the region through frequent flooding and erosive processes.

- There is lack of inter-state cooperation and coordination in dealing with water-induced challenges.

- Appropriate water and forest development and management could provide benefits in the form of hydropower, agriculture, inland water transport, biodiversity conservation, reduced flood damage and erosion, longer dam-reservoir life, forestry, and ecotourism.

Meghalaya's Profile

- Area : 22,429 kms; Pop: 29.7 lakhs (2011)
- 11 districts
- Wettest state in the country with an average rainfall of 1,200 cms; having large number of streams and rivers
- Diverse soil types: red loamy, laterite, red and yellow
- Soil textures range from loam to silty loam & alluvial

Water Situation in Meghalaya Prior to IWF Intervention

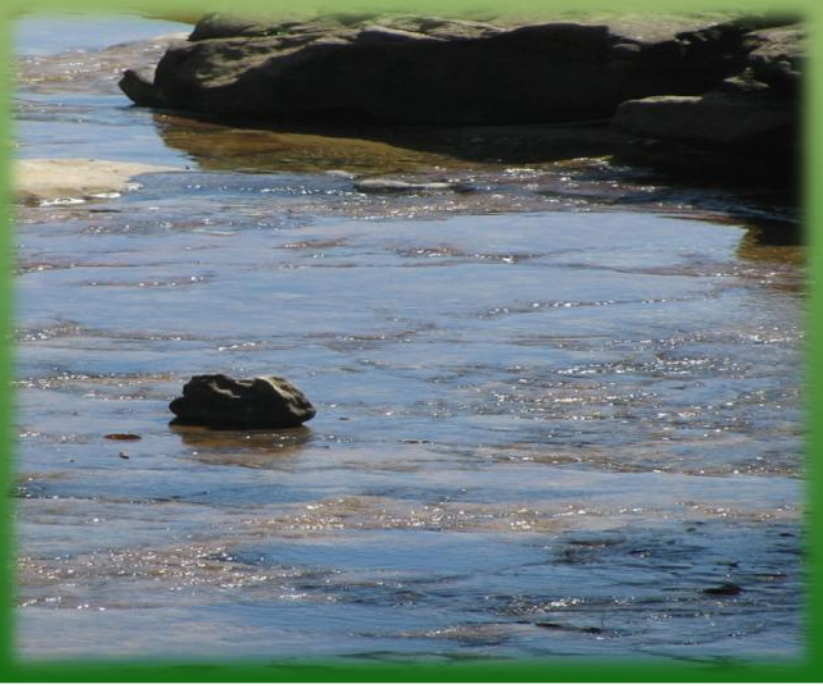
- Cherrapunji, once know as the wettest place on Earth, was turning into a "wet desert" because of negligence;
- The water of rivers and streams passing through the Jaintia Hills was badly affected by contamination of Acid Mines Drainage (AMD), leaching of heavy metals, and organic enrichment etc;
- Absence of institutional mechanism to monitor water quality;
- Lack of inter-state cooperation and convergence between Ministry of Water Resources, Government of India and Government of Meghalaya in water sector;

- Deficiency of emphasis on Public-Public Partnership in water sector;

- Lack of comprehensive understanding of Water systems in the state
- Abundance of water, rainfall is high, not amenable in all cases for large scale projects because of topography

- Non-involvement of people in water-related activities at the local and community level;

- No emphasis on capacity-building of stakeholders and water users in water sector.



IWF Intervention in Water Sector in Meghalaya

- The IWF offered its assistance in capacity building of the people by sensitizing them about water and environment-related issues through education, corner meetings, and arranging video-shows etc.
- Provided water monitoring kits to the Government of Meghalaya in early November 2010, to help monitor the quality of water with the help of school children;
- Emphasized on encouraging participation of all stakeholders in the integrated water resources development and management;
- Stressed on need for State Government to adopt integrated approach while formulating the water resources management strategy;

➢Suggested need for up scaling the innovative structures like *Jal kund*, baoris, small springs etc. in the hilly terrains of North Eastern Region for rainwater harvesting along with integrated farming of high value crops;

➢Emphasized on urgency for encouraging local indigenous traditional knowledge, such as bamboo pipe irrigation / low cost bamboo filter shallow tubewell / wheel and bucket method of extraction in the rural areas;

➢Suggested need for disseminating knowledge about techniques/ technologies that improve the efficient use of water at grassroots level of community/village / Panchayat / Block;

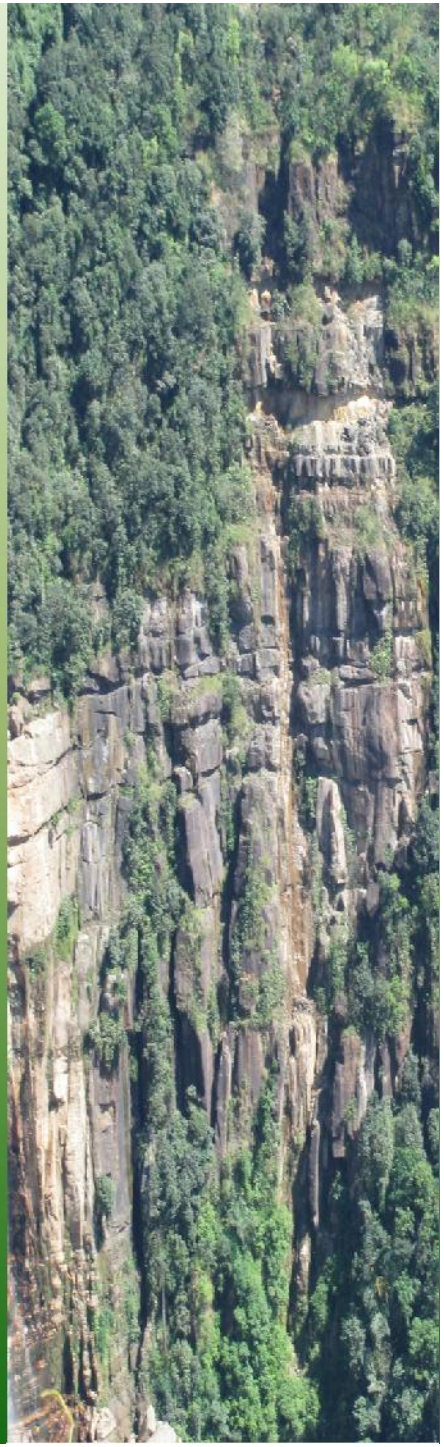
➢Stressed on urgency for encouraging use of High Density Polyethylene (HDPE) and Low Density Polyethylene (LDPE) pipes in drinking water supply and irrigation to prevent leakages and transit loss;

- Called for according priority to Water quality monitoring sector;
- Need for strengthening of infrastructures, human resources and up gradation of existing laboratories both in State level and Central level to facilitate micro-level quality monitoring;
- Emphasized on urgency for according top most priority for preservation of catchment area with scheme of a forestation so that water conservation is accelerated and soil erosion is prevented;
- Stressed on the need for harnessing Public-Public Partnership (PPP) model in water sector in the state;
- Called for the need for encouraging civil society (e.g. India Water Foundation and others) participation in water sector for better convergence, water quality monitoring etc.
- Facilitated convergence between Ministry of Water Resources, Government of India and Department of Water resources, Government of Meghalaya; as well as between India Metrological Department under Ministry of Earth Sciences (Govt. of India) and Government of Meghalaya.

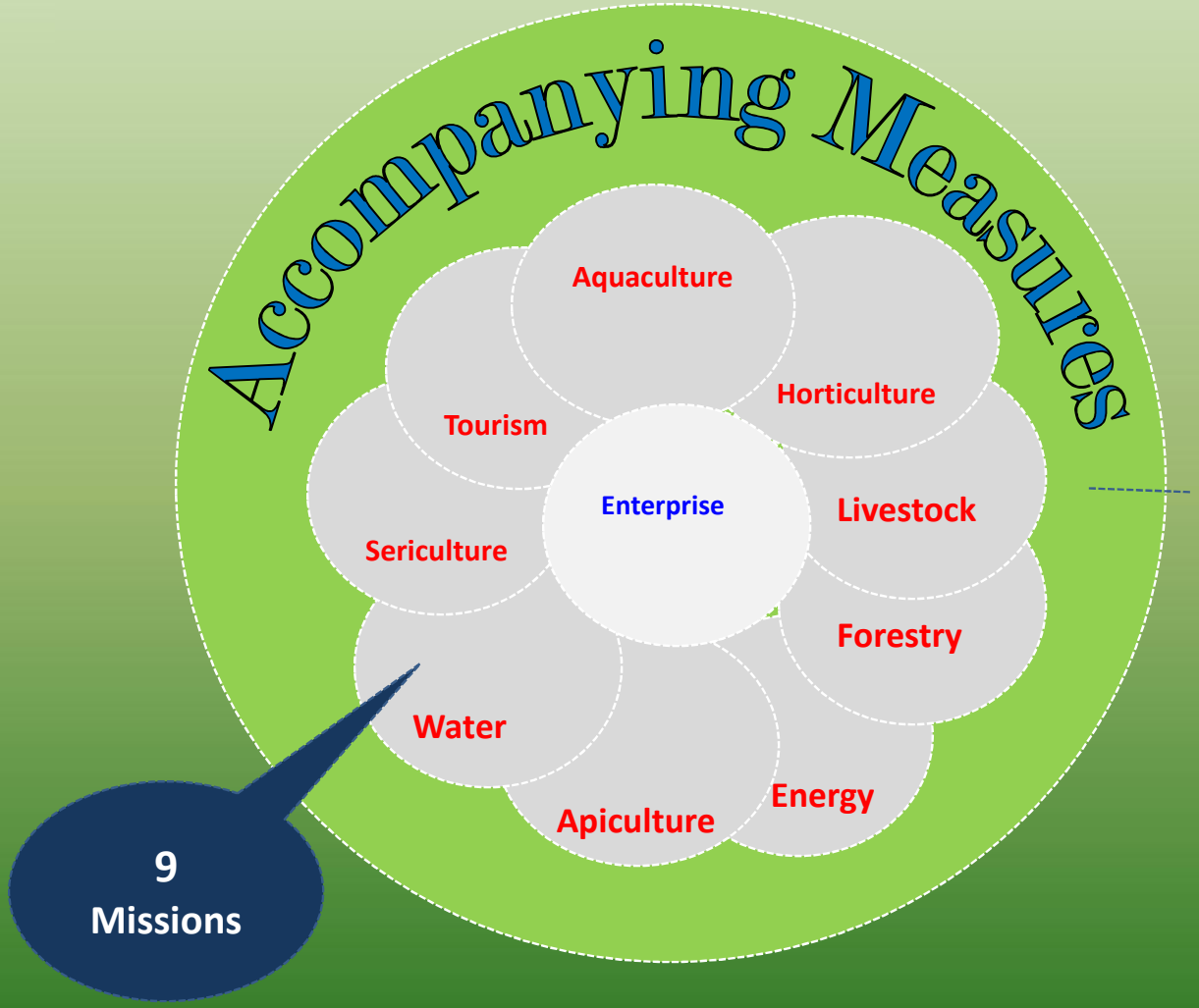
Resultant Impact

The IWF interventions proved instrumental in persuading the Government of Meghalaya in undertaking following major initiatives in water sector:

- On 22 August 2012, a Memorandum of Understanding (MoU) was signed between India Water Foundation and the Meghalaya Basin Development Authority (MBDA) on cooperation in the field of water resources in Meghalaya.
- The State Government has launched recently Water Mission which aims at promoting Integrated Water Resource Management (IWRM) and building of water-based and water-related livelihood and enterprise opportunities for the people.
- Water has been made key to State government's initiative of Integrated Basin and Livelihood Development Program (IBLDP), which addresses various issues of sustainable development related to water and natural resource management, capacity building, development of infrastructure etc., with climate change perspective.



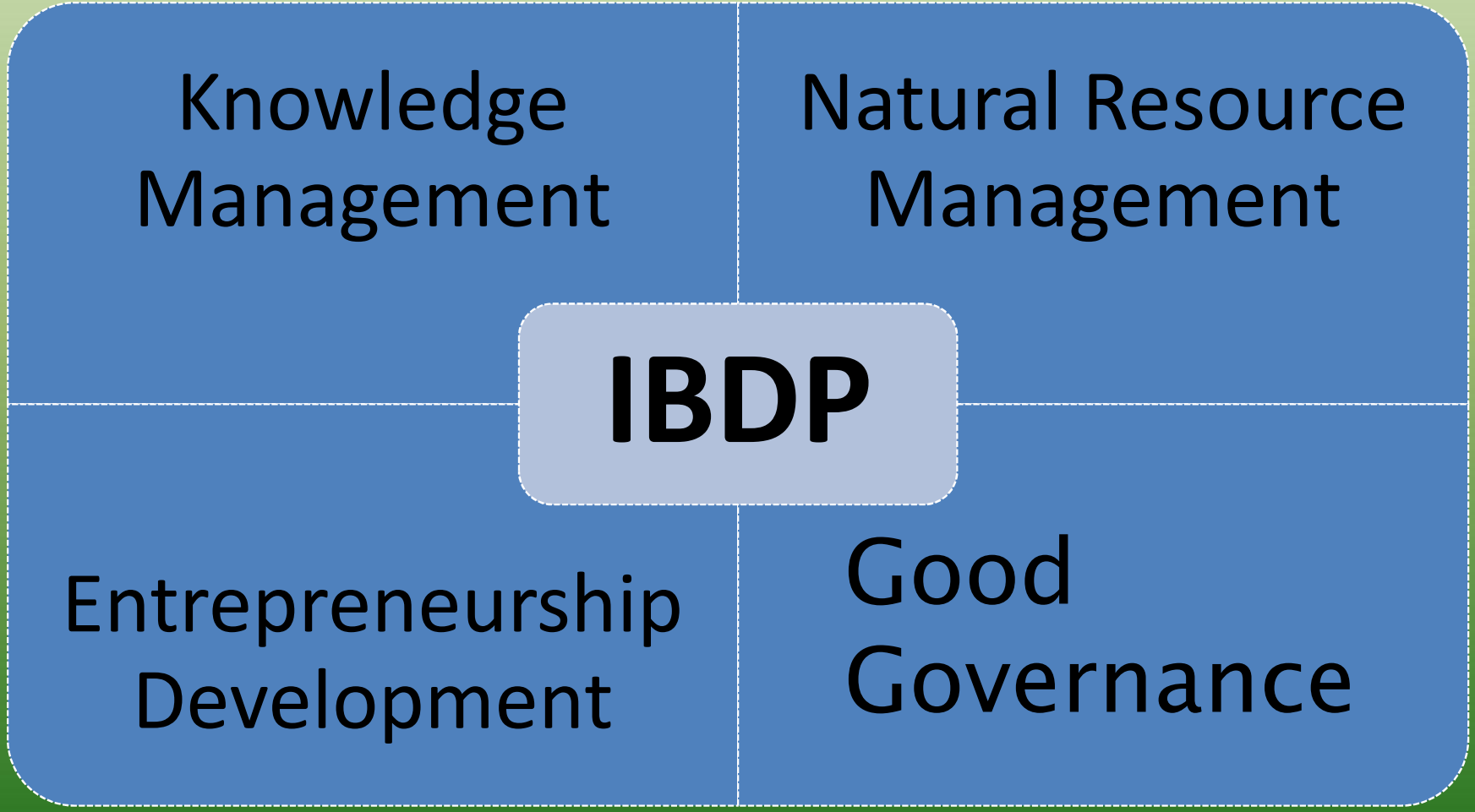
IBDLP - 20 Point Integrated Basin Development Framework



Accompanying Measures

- Information and Comm. tech
- Knowledge Mgt.
- Communication
- Capacity Building
- Infrastructure
- Governance
- Policy Support/ Legislation
- Institutional development (SHG, Federations, Producer groups)
- Financial inclusion
- Market Linkages
- Convergence

Pillars of the Integrated Basin Development Programme



- The government has established District Water Resources Councils at each district level to look at the integrated development of water resources in convergence with relevant schemes.

- Water Users Associations (WUAs) have been set up at the village level to usher in a regime of demand-based water management.

- Recently, the state government has circulated its draft of the Water Act and Water Policy to all stakeholders for consultations.

- The government is preparing water harvesting strategies in the form small multipurpose reservoirs to impound water along the cascades and use it for various purposes drinking, sanitation, irrigation, aquaculture, micro-hydel, eco-tourism etc.

- Besides, JALKUNDS or ‘stand-alone structures’ are being installed for tapping rainfall for upland irrigation.

CONCLUSION

Meghalaya's ability to embark on a sustainable development through judicious management of water resources would simultaneously advance its economic and developmental objectives, which are essential in making it a hub for sustainable development in the North-East region of India as well as neighbouring countries of South and South-East Asia.

In this regard, following suggestions are offered:

- There is increased need for inter-state synergy and convergence with Central Government in water sector to enhance partnership on Public-Public cooperation basis.

- The new water related policies and schemes recently launched in Meghalaya require their sincere implementation and also call for periodic monitoring.

- Involvement of civil society in the decision-making and implementation process in water sector in Meghalaya is still negligible and it calls for increased interaction between the government and the civil society.
- The institutional mechanism established in water sector needs to elicit the cooperation of the civil society for capacity building of the stakeholders at community and village levels.
- The data generated in water sector remain concentrated in selected government agencies and the data are not available to other stakeholders in general. The data should be made available to all stakeholders.
- The Centre-focused emphasis of the organizational structures for water, which play the driving roles with regard to planning and knowledge creation, archiving, and use, should have adequate representation of the state and civil society to be able to play a bridging role between the organization and the local stakeholders.

THANKING YOU

www.indiawaterfoundation.org

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