

Brahmaputra Board at a Glance

1.0 Brahmaputra Board

The Brahmaputra Board, a statutory body was set up under an Act of Parliament called the Brahmaputra Board Act, (Act 46 of 1980) under the Ministry of Irrigation (Now renamed as Ministry of Water Resources). The jurisdiction of the Board includes both the Brahmaputra and Barak Valley and covers all the States of the North Eastern Region, Sikkim and part of West Bengal falling under Brahmaputra basin. The Board consists of 21 Members (4 full time Members and 17 part time Members), representing seven states of the North Eastern Region, North Eastern Council, concerned Ministries - Ministry of Water Resources, Agriculture, Finance, Power & Surface Transport - and Departments of the Government of India - Central Water Commission, Geological Survey of India, India Meteorological Department and the Central Electricity Authority.

Since creation of Ministry of Development of North Eastern Region (DoNER) and inclusion of Sikkim and part of West Bengal within the jurisdiction of Brahmaputra Board, a representative of DoNER, the Secretary, Irrigation & Flood Control Department(I&FCD), Sikkim, the Secretary, Irrigation & Waterways (I&W) Department, West Bengal, the Chief Engineer, Brahmaputra & Barak Basin (B&BB),Central Water Commission, Shillong and Adviser, North East (NE), Planning Commission are invited as Special Invitees in Board meetings.

The Board started functioning with its Headquarters at Guwahati from 11th January 1982. As per sub-section (2) of section (3) of the Brahmaputra Board Rules, 1981, Board has established a Liaison Office at New Delhi.

1.1 Objectives

Basic objective for establishment of Brahmaputra Board is Preparation and Implementation of Master Plans, in association with States, for management of flood, bank erosion and drainage congestion and development and utilization of water Resources of the Brahmaputra Valley

2.0 Brahmaputra and Barak River System

The river Brahmaputra is one of the largest rivers of the world with a specific yield of 85 ha m / sq km, which is next only to Amazon (87 ha m /sq km). Brahmaputra is the principal arm of the Ganga-Meghna- Brahmaputra system. It originates from Kanglungkang glacier east of Manas–Sarovar at an elevation of 5150 m and traverses 1625 km in Tibet, 918 km in India (278 km in Arunachal Pradesh and 640 km in Assam) and 363 km in Bangladesh. The Brahmaputra basin extends over an area of 5,80,000 sq km, out of which 2,93,000 sq km is in Tibet, 2,40,000 sq km in India and Bhutan and 47,000 sq km in Bangladesh. During its course in the Assam Valley from Kobo to Dhubri, about 26 important tributaries on its north bank and about 13 on south bank join the river. Some of the north bank tributaries originate from snow clad Himalayas and others from the lower Himalayas. The total annual flow of the river is about 573 BCM at Jogighopa on Indo-Bangladesh border, which is 29% of the total surface flow of the country. Average width of the Brahmaputra Valley is 80 km, out of which the river itself occupies about 1.5 km to 25 km.

2.1 Brahmaputra River

The Brahmaputra River is braided and unstable in its entire reach in the Assam Valley except for a few places. The instability of the river is attributed to high sediment charge, steep slope and transverse gradient. Apart from these, the entire area is in a seismic zone and receives earthquake shocks of moderate to severe intensity from time to time. The problem of siltation has been further aggravated due to landslides caused by high rainfall. Some manmade avoidable actions in the form of shifting cultivation and non-scientific commercial exploitation of forest, etc. have also accelerated the process of soil erosion in the catchments. The silt brought in the process gets deposited as the river descends into the plains with sudden reduction in slope, with the consequent reduction in the flow velocity and its sediment carrying capacity. Due to heavy deposition of silt, the river has frequently changed its course. Excessive silt deposition has also given rise to braiding and meandering pattern in the alignment of the river system. The world's largest river island "Majuli" in upper Assam lies in the river. The left bank tributaries of the river Brahmaputra pass through stable reaches with flat slopes and carry lower sediment load of finer size. By hypsometric analysis of the tributaries, it is seen that the North bank tributaries indicates relatively young stage while the South bank tributaries

indicate a mature stage. This has given rise to inherent tendency of river Brahmaputra to shift its course towards south and the river flows by the side of hills at many places along its bank.

The flood in Brahmaputra Valley is a recurring phenomenon and has been causing large scale damages every year. The reasons for flood can be summarized as below-

- Inadequate capacity of the river channel due to braided nature thereby spilling of floodwater over the banks.
- Drainage congestion at the outfall of tributaries during the high stage of the main river, and
- Excessive silt load in the river due to soil erosion and large scale slides in the hilly catchments.

The main crops grown in the Brahmaputra Valley are paddy, jute, mustard, pulses, wheat and sugarcane. Paddy and jute are mainly grown and harvested during monsoon period. Out of four types of paddy crops viz. the Ahu, Sali, Bao and Boro, which constitute about 92% of the cropped area, the first two namely Ahu and Sali are generally affected by floods. The maximum area affected due to floods in the Brahmaputra Valley (including Barak) during the period 1953-2006 was approximately 4.00 M.ha. The flood damage includes crop damage and the permanent loss of land due to erosion. A number of lives are also lost during each flood.

The flood and river management measures adopted so far in the valley are mostly of short term structural measures such as construction of embankments, permeable and impermeable spur, revetment etc. and are area specific only. The poor maintenance of the flood management structures generally causes unexpected miseries to the people in case of their failure. The efficacy of these measures especially in the river system of Brahmaputra, which is highly aggrading/ degrading in different reaches, is also debatable. As such, there is a need for constructing storage reservoirs in combination with other structural/ non-structural measures. The latter can be decided after studying the river behavior using scientific tool.

For management of floods, erosion control and improvement of drainage congestion, the Board has prepared Master Plans for the Brahmaputra main stem and its 39 tributaries and Majuli Island. There is also a need to implement the various recommendations made in the Master Plans of Brahmaputra sub-

basin prepared. The regional Task Forces "B" for flood management in N.E. Region has also submitted its report to the Ministry of Water Resources, which should be taken into consideration for early implementation in a time bound manner.

2.2 Barak River

The river Barak is a part of the Ganga-Brahmaputra Meghna system and is the second largest river of the N.E. Region having eight major tributaries. It originates from a hill east of Mouthana at an elevation of about 2840 m in the southern slopes of Nagaland/Manipur. The Barail, Patkai and Lussai hills bound the sub-basin on its three sides. The total catchment area of the Barak sub-basin up to Indo-Bangladesh border is 41,704 sq km. Out of which 751 sq km lies in Myanmar. The annual flow from Indian catchment is 29,600 m cu m at Badarpurghat. The length of the river from its source up to Bhanga in Cachar district is 532 km after which the Barak bifurcates into two branches known as the Surma and the Kushiara. These two branches enter Bangladesh and again join to form a single river channel and flow up to Bhairab Bazar where it meets with Meghna in Bangladesh.

The river Barak is joined by a number of hill streams on both its banks. The flood occurs frequently in this valley causing extensive damage to lives and properties. In order to manage the problem of flood, erosion and drainage congestion, various measures have been taken from time to time by way of construction of embankments, bank protection and drainage improvement works etc. These measures have provided adequate protection to the people of the valley against low and medium floods. In case of high floods, the embankments are not able to withstand heavy pressure, consequently number of breaches occur which cause devastating flood in the valley. In order to deal with the problems of flood, bank erosion, drainage congestion etc, Board has prepared a Master Plan for the Barak sub-basin and Dhaleswari, one of major tributaries of Barak.

2.3 Other Rivers

There are eight important rivers in Tripura. These rivers are causing flood frequently in the State. Based on investigation and data collected from the state Govt. and various other Central Agencies, Brahmaputra Board has prepared Master Plan for all these rivers and these have been approved by the Central

Govt. The Master Plan envisages various structural and non-structural measures to tackle flood problem, erosion control and recommendable drainage congestion.

3.0 High Powered Review Board

A High Powered Review Board to oversee the work of the Brahmaputra Board was constituted with the Union Minister of Water Resources as the Chairman and Chief Ministers of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura and Union Ministers / Ministers of State for Finance, Transport, Power, Agriculture, Central Water Commission as Members. The Chairman, Brahmaputra Board is the Member-Secretary and the Member, River Management (RM), Central Water Commission (CWC) is a permanent invitee. The High Powered Review Board of Brahmaputra Board was constituted by Ministry of Water Resources, Government of India through Resolution No. 2(17)/80/FC/460 dated 19.03.1982 and subsequently amended through Resolution No.23/8/925-ER dated 01.10.1992.

So far, six meetings of High Powered Review Board have been convened. The sixth and last meeting of High Powered Review Board was held at Guwahati on 18th January 2012 under the Chairmanship of Shri Pawan Kumar Bansal, Hon'ble Minister of Water Resources and Parliamentary Affairs, Government of India.

4.0 Standing Committee of Experts on Majuli Island

A 'Standing Committee of Experts on Majuli Island' under the Chairmanship of Member (River Management), Central Water Commission, New Delhi was constituted by Ministry of Water Resources, Government of India in October 2007 to recommend works to be undertaken and review of progress / execution of works for protection of Majuli Island, Assam from floods and bank erosion of River Brahmaputra. 8 Meetings of committee have so far been convened. The 8th and last Meeting was held under in January 2013.

5.0 Standing Committee

In pursuance to decision by Brahmaputra Board in its 11th Meeting held on 15th September 1988, a Standing Committee was constituted under the Chairmanship of Vice Chairman, Brahmaputra Board.

6.0 Preparation of Master Plans

The Brahmaputra Board had taken up preparation of Master Plans of the main stem of the Brahmaputra and Barak along with 57 (including Majuli Island) major tributaries of the region in three parts-

Part	River	Number	Status
Part-I	Main stem Brahmaputra River	1	Approved by Government of India
Part-II	Master Plan on Barak River and its tributaries except Dhaleswari	1	Approved by Government of India
Part-III	Master Plan on tributaries of the Brahmaputra and rivers of Tripura including Majuli Island and Dhaleswari	66	<ul style="list-style-type: none"> o Approved by Government of India-47 Master Plans o Approved by Board and submitted to MoWR for Approval of Government of India-4 Master Plans o Approved by Board and in process of submission to MoWR for Approval of Government of India-4 Master Plans o Completed and in the process for circulation to Board Members -3 Master Plans o Identified for 'Survey & Investigation' and preparation- 8 Sub-basins
Total		68	

All 57 Master Plans have been completed by Brahmaputra Board. Out of above, 49 Master Plans have been approved by Government of India and remaining 8 Master Plans are under processing in Ministry of Water Resources, Government of India.

6.1 Current Assignment for Preparation of Master Plans

A meeting was convened under the Chairmanship Dr R C Laloo, Hon'ble Minister of Forest and Environment, Government of Meghalaya on 22nd June 2010 in Shillong to discuss the follow up actions on matter related to Integrated Water Resources Development in the State of Meghalaya. Shri Vincent Pala, Hon'ble Minister of State, Ministry of Water Resources, Government of India was Chief Guest in the meeting. The Hon'ble Minister of State, Ministry of Water Resources, Government of India desired in the meeting for preparation of Master Plans of

all Rivers of Meghalaya by Brahmaputra Board. Such a decision was communicated by Ministry of Water Resources to Brahmaputra Board through letter No: 19/2/2010-B&B/3114 dated 28 July 2010. In pursuance to above, a 'Joint Committee' under the Chairmanship of Chief Engineer (P&D) (now Chief Engineer-I), Brahmaputra Board was constituted by Ministry of Water Resources through Office Memorandum No:19/2/2010-B&B/3563-3580 dated 3rd September 2010. The following are rivers of Meghalaya identified for preparation of Master Plans –

1. Waikhrywi
2. Umtrew
3. Ganol
4. Bugi
5. Dareng
6. Umsohryngkew
7. Umiew
8. Myntdu
9. Lubha

7.0 'Survey & Investigation' and Preparation of Detailed Project Reports

Brahmaputra Board took up 'Survey & Investigation' of 14 of Multipurpose Projects in Brahmaputra and Barak Basin and in the south flowing rivers of Meghalaya.

7.1 Detailed Project Reports (DPRs) Completed

Out of above, after 'Survey & Investigation' and Detailed Project Reports (DPRs) in respect of following Projects have already been completed and the Projects are under commissioning by various Agencies -

Sl.No.	Name of Project	Implementing Agency
1.	Siang Dam Project	National Hydroelectric Power Corporation
2.	Subansiri Dam Project	National Hydroelectric Power Corporation
3.	Tipaimukh Dam Project	North Eastern Electric Power Corporation
4.	Pagladiya Dam Project	Brahmaputra Board
5.	Bairabi Dam Project	Government of Mizoram

7.2 Partially Completed Detailed Project Reports (DPRs)

The following four Water Resources Projects located in Arunachal Pradesh and Mizoram, under 'Survey & Investigation' in Brahmaputra Board were handed over to the Agency / State Government for commissioning after completion of remaining works –

Sl. No.	Name of Project	Implementing Agency
1.	Debang Dam project	National Hydroelectric Power Corporation
2.	Lohit Dam Project (On completion of 'Survey & Investigation')	Government of Arunachal Pradesh
3.	Kynshi Stage-I Dam project	Government of Meghalaya
4.	Kynshi Stage-II Dam project	Government of Meghalaya

7.3 Projects under 'Survey & Investigation' and Formulation of Detailed Project Reports

The following Five Water Resources Projects are presently under 'Survey & Investigation' in Brahmaputra Board-

Sl.No.	Name of Project	Location
1.	Kulsi Multipurpose Project	Assam on border with Meghalaya
2.	Noa-Dehing Dam Project	Arunachal Pradesh
3.	Simsang Dam Project	Meghalaya
4.	Jiadhoh Dam Project	Assam on border with Arunachal Pradesh
5.	Killing Dam Project	Assam Meghalaya border

7.3.1 Kulsi Multipurpose Project

The project site is located about 1.5 Km downstream of Ukium, a border village of Assam and Meghalaya. Brahmaputra Board took up the survey and investigation work of Kulsi M.P. project Hydro Power, Irrigation and flood moderation in the basin in the year 1997. The installed capacity of the project is estimated as 58 M.W. with a gross command area of about 26000 ha. The target for completion of the DPR of this project is 2014-15.

Present status

1. A Design team of CWC visited project sites of Kushi MP Project on 19th and 20th December, 2009 and suggested some modification in the lay out and some additional geological investigation.
2. Hydrological studies have been vetted by CWC.
3. Power Potential Studies including techno-economic analysis on financial soundness of the project as suggested by the Design Team has been carried out and submitted to CEA for concurrence.
4. Topographical survey, Geological investigation and construction materials surveys as suggested are in progress.
5. EIA & EMP studies in final stage.
6. CWC has been requested to take up the work of balance survey and investigation and preparation of DPR so as to complete the DPR within scheduled time of completion.

7.3.2 Noa-Dehing Dam Project

The Project site is located about 4 Km upstream of Miao Town in Changlang District of Arunachal Pradesh. The investigation of this project was started in December, 1996. The installed capacity of the project is estimated at 75 MW (tentative). Field activities under the project have already been completed. The target for completion of the DPR of this project is 2013-14.

7.3.3 Simsang Multipurpose project

The project is located on the Simsang River with the dam site at Rongkhandi near Nangwalbibra township under East Garo hills District of Meghalaya. The survey and investigation work of this project was taken up by Brahmaputra Board in the last part of the year 1997. The installed capacity of this project is estimated at 65 MW (tentative). The target for completion of the DPR of this project is 2014-15.

Present status

- Topographical survey mostly completed
- Pre-feasibility report prepared

- Geological investigation in progress
- Construction material survey completed
- Two alternate layouts of water conductor system have been proposed by the Board and submitted to the CWC for finalization of one of the alternatives for further investigation.

7.3.4 Jiadhah Dam Project

Jiadhah Dam project is located about 5 Km upstream of Jiadhahmukh which is Assam-Arunachal Border area. Investigation of this project was taken up in November, 2002. The installed capacity of the project is estimated at 70 MW (tentative). CWC Design team has been requested for a field visit to finalize the layout and other project parameters of the project. The target for completion of the DPR of this project is 2014-15.

Present status

- Topographical survey in progress
- Geological investigation in progress
- Construction materials survey in progress
- EIA& EMP studies are in progress
- Two alternate layouts of the project have been proposed by the Board and submitted to the CWC for finalization of one of the alternatives.

7.3.5 Killing Dam Project

The project site is located at Assam-Meghalaya Border area. Brahmaputra Board started Survey & Investigation of this project in November, 2003. The installed capacity of the project is estimated at 85 MW. The target for completion of the DPR of this project is 2014-15.

Present status

The Design team of CWC visited project sites of Killing MP Project on 20th December, 2009 and reviewed the proposed layout. It was suggested by the CWC to carry out optimization studies based on tentative costs at different dam heights for finalization of the project parameters. Accordingly the studies have been carried out and submitted to CWC for vetting. CWC has broadly agreed to the proposal submitted by the Board and suggested some additional studies/investigations. The additional studies/investigations are in progress

8.0 Implementation of Anti-erosion Measures

8.1 Anti-erosion Measures Completed

Brahmaputra Board has successfully completed the following anti-erosion measures in Assam and Nagaland -

- Protection of Nagrijuli, Rangia Town, Mukalmua and Barbhag area from floods and erosion of river Puthimari
- Anti-Erosion measures to protect Kushiabil & Durgajan village at Dimapur of river Dhansiri(S) in Nagaland

On completion above schemes have been handed over to respective States for routine maintenance.

8.2 Implementation of Anti-erosion Measures underway

8.2.1 Protection of Majuli from floods and erosion

Majuli is the largest inhabited River Island in the world. It is situated between latitudes 26°45'N and 27°10'N, and longitudes between 93°40'E and 94°35'E. Majuli has been the cultural capital and the cradle of Assamese civilization since the 16th century. Sankardeva, a pioneer of the medieval-age neo-vaishnavite movement, preached a monotheist form of Hinduism called as Vaishnavism and established monasteries and hermitages known as satras. The satras preserve antiques like weapons, utensils, jewellery and other items of cultural significance. The inhabitants of Majuli are mostly tribals - predominantly from the Mishing, Deori and Sonowal Kacharis tribes. Majuli is also famous for pottery.

Majuli Island has constantly been subjected to erosion by the mighty Brahmaputra. Responsibility for undertaking anti-erosion works for protection of Majuli Island was given to Brahmaputra Board in the year 1999. Physical activities on the ground started in the year 2004.

The total area of the land mass of Majuli Main Island was 502.21 sq km in the year 2004. Since the year 2004, with regular implementation of anti-erosion / bank protection measures by Brahmaputra Board, the total area of Majuli Island has increased to 522.73 sq km till the year 2013. Currently, works under Phase-II and Phase-III are under execution, since 11th Five Year Plan. Spillover works -

such as completion of five spurs, river bank revetment, laying porcupines, construction of 'Raised Platforms' in low lying flood vulnerable areas are under execution and targeted to be completed by March 2014.

8.2.1.1 Financial Implication

Expenditure incurred by Brahmaputra Board on undertaking measures for protection of Majuli Island from floods and erosion since January 2004 under various Phases is detailed below-

Sl. No.	Description	Estimated Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Remarks
1	Immediate Measures (Year 2004-2005)	6.22	5.92	Completed
2	Phase- I (Years 2005-2011)	56.07	53.40	Completed
3	Emergent Measures (Year 2008)	4.99	4.62	Completed
4	Phase-II & Phase-III (December 2013)	115.99	84.12 (up-to December, 2013)	71.57% of physical progress has been achieved. The scheme is targeted to be completed by March 2014.
Total		183.27	148.06	

8.2.1.2 Outcome

The following are the major achievements –

- Raising and Strengthening of 96.2 km of Embankment
- Without exception, there has continuously been loss of land of Majuli Island. Since implementation of protection measures by Brahmaputra Board trend of land loss got reversed. Particulars on net gain of land mass in Majuli Island are tabulated below -

Year	Area of Majuli Island (in sq km)	Net Area reclaimed (in sq km)
2004	502.21	
2008	506.37	4.16
2011	520.26	13.89
2013	522.73	2.47
Total		20.52

8.2.1.3 Plan Ahead

Ministry of Water Resources, Government of India has constituted a 'Standing Committee of Experts' under the Chairmanship of Member (River Management), Central Water Commission to undertake visits to the work sites, advice / recommend and monitor implementation of protection measures. Based upon recommendations of 8th visit of 'Standing Committee of Experts', Brahmaputra Board has formulated a scheme – **Protection of Majuli Island from Floods and Erosion-Phase-IV** – at the estimated cost of Rs 200.13 crore for implementation during the 12th Five Year Plan. The scheme is under 'Techno-Economic' appraisal in Central Water Commission.

8.2.2 Avulsion of Brahmaputra at Dhola-Hatighuli (Restoration of Dibang and Lohit Rivers)

Avulsion of left bank of River Lohit occurred, at confluence of Lohit with Dibang - near Dhola-Hatighuli located in Dumdooma, Civil Sub-division of Tinsukia district - in the year 1989, due to breach in Saikhowa Bund. Gradual widening of the channel with time was threatening existence of more areas of Tinsukia and Dibrugarh Districts of Assam, situated all along the newly developed channel. Initially significant combined flow of Dibang and Lohit rivers started to flow through Ananta Nala to Dangari – a tributary of river Dibru. Since the year 2000 the Balu Nala became dominant and almost entire diverted flow of Lohit and Dibang Rivers started passing through Balu Nala. Gradual widening of the channel with time was threatening existence of more areas of Tinsukia and Dibrugarh Districts of Assam, situated all along the newly developed channel.

The scheme “Avulsion of Brahmaputra at Dhola-Hatighuli (Measures for diversion of River Dibang to its original course) with ancillary anti-erosion measures” prepared by Government of Assam was approved by Ministry of Water Resources, Government of India in the Technical Advisory Committee (TAC) meeting held in May, 2002 and the Brahmaputra Board was entrusted with the responsibility for execution of the scheme. Total expenditure of Rs 49.39 crore has so far been incurred by Brahmaputra Board on execution of works envisaged under Phase-I through Phase-III and a part of works contemplated under Phase-IV.

With construction of 'Tie-Bund', the lands earlier used to form part of main channel of Dibang River are now completed protected from floods and erosion. The inhabitants deserted areas have returned back and restarted cultivation in a big way.

11 villages under Doomduma Revenue Circle in an area of about 1500 ha got protection from floods, since the year 2004 onwards, on construction of retirement bund at Hatighuli area on Left bank of Lohit river.

Sl. No.	Description	Estimated Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Remarks
1	Phase-I (January 2003 to July 2004)	10.47	10.47	Completed
2	Phase- II (January 2004 to July 2004)	5.22	4.16	Completed
3	Phase-III (March 2007 to July 2007)	8.47	8.58	Completed
4	Phase-IV(December 2013)	54.43	46.86 (up-to December 2013)	96% of the physical progress has been achieved.
	Total	78.59	70.07	

8.2.3 Anti-erosion Schemes Planned to be executed during 12th Five Year Plan

The following Anti-erosion Schemes are planned to be executed during the 12th Five Year Plan –

- Protection of Majuli Island from flood and erosion Phase –IV
- Conversion of the existing tie bund across the spill channel of river Dibang from chainage 480.00 m to chainage 2550.00 m in to a full-fledged embankment at Bahbari
- Restoration of original channels of Dibang and Lohit Rivers at Dhola-Hatighuli' Phase-V
- Protection of Balat Village in Meghalaya on River Umngi
- Anti-erosion works for protection of Mankachar, Kalairalga international border area from erosion of river Brahmaputra Assam
- Anti-erosion measures in Maslabari in Assam near International Border
- Anti-erosion measures in Bhajaner Charra, Cooch Behar, West Bengal
- Bank Protection work in Bhogdebri area, Cooch Behar, West Bengal

9.0 Drainage Development Schemes

34 drainage-congested areas in Brahmaputra and Barak basin have been identified in the Master Plan of Brahmaputra River (Main stem). Subsequently 7 more drainage-congested areas have been identified in the Brahmaputra Basin. Thus total identified drainage-congested areas come to 41 based upon studies carried out under 49 approved Master Plans.

The Status, in brief, in respect of 41 Drainage Development Schemes (DDS) is given below –

Sl. No.	Description	Number	
1	Schemes identified based upon findings of 49 Master Plans	41	
2	Schemes thus far cleared by CWC	11	
	(a) Schemes execution completed		2
	(b) Schemes under execution		4
	(c) Schemes execution suspended		2

Sl. No.	Description		Number
	(d)	Scheme handed over to State	1
	(e)	Scheme proposed to execute	1
	(f)	Scheme dropped from execution	1
3	Schemes (DPR) under appraisal of CWC		6
4	Schemes (DPR) observations sent by CWC and compliance are being attended in Board		5
5	Schemes under 'Survey & Investigation and Preparation of DPR'		14
6	Schemes dropped from the list of identified schemes of Brahmaputra Board		2
7	Schemes under examination for deletion from the list of identified schemes of Brahmaputra Board		3

9.1 Completed Drainage Development Schemes

9.1.1 Harang Drainage Development Scheme

The scheme - located in Barak Valley on the border of Bangladesh near Badarpur with estimated cost of ₹ 30.49 crore - has been completed physically in all respects during March, 2011. The scheme has already been handed over to Water Resources Department, Government of Assam.

9.1.2 East of Barpeta Drainage Development Scheme

The original estimate of the project was for ₹ 1.34 crore and it was revised to ₹ 2.96 crore. The scheme was taken up for execution in March, 2009 and completed in June, 2011. Expenditure incurred against this scheme is ₹ 2.70 crore upto March, 2012. The scheme has already been handed over to Water Resources Department, Government of Assam.

9.2 Under Execution Drainage Development Schemes

9.2.1 Jakaichuk Drainage Development Scheme

The scheme is under execution in Brahmaputra Board since 2008. An amount of ₹ 1.35 crore till March, 2012 has been spent against the estimated cost of ₹ 2.96 crore with physical progress of 45% and further progress of work is held up since November 2010 due to objection of the local inhabitants on non-existence of an overflow section in the sluice. The sluice has been designed by IIT, Guwahati. Efforts are to arrange immediate visit of the concerned designer from IIT Guwahati to the project site for an early finalization of the design parameters of the overflow section so that work could be resumed without any further loss of time.

9.2.2 Borbhag Drainage Development Scheme

Brahmaputra Board took up the execution of Borbhag Drainage Development Scheme during the year 2006. The scheme was subsequently revised to ₹ 11.70 crore in the year 2010. Two components of the work - (1) Raising and strengthening of embankment and (2) Re-sectioning of channel - have already been completed. Physical progress up to March 2012 is 30.90% at the total expenditure of ₹ 3.83 crore. The revised estimate of ₹ 13.90 crore, including cost toward detailed design of sluice carried out by IIT, Guwahati is in advanced stage of finalization in CWC, Shillong. The target date of completion of the scheme is March, 2014-15.

9.2.3 Amjur Drainage Development Scheme

Techno-economic clearance of the scheme for an amount of ₹ 14.15 crore was received in January, 2006. The execution of Amjur DDS was taken up in the year 2006-07. Out of the two components (i.e. sluice regulator and embankment), the work for 'Raising and Strengthening' of existing embankment was taken up first. Process of land acquisition for construction of new embankment as well as remaining part of 'Raising and strengthening' work is going on. The design of the sluice is assigned to CWC. At the total expenditure of ₹ 10.99 crore till March 2012, against the sanctioned cost of ₹ 14.15 crore, 32 % physical progress has been achieved under the scheme. Further progress of work is held up on account of delay in finalization of land acquisition for the scheme.

9.2.4 Jengrai Drainage Development Scheme

Techno-economic clearance of Jengrai DDS was received in the year 2006-07. The scheme is presently under execution. The physical progress of work under Jengrai DDS is 27% at the total expenditure of ₹ 1.04 crore against the sanctioned amount of ₹ 1.49 crore. Further progress of work was held up since March 2008. Revised estimate amounting to ₹ 4.29 crore was submitted to CWC in March 2010, based on detailed design of the sluice. Some observations on the revised estimate raised by CWC have subsequently been complied and the modified DPR has also been submitted to CWC. The target date of completion of the scheme is March, 2014-15.

10.0 Pagladiya Dam Project

This project meant for flood moderation to benefit an area of 40000 ha, irrigation to 54,160 ha and incidental power generation of 3 MW, is proposed across Pagladiya River at Thalkuchi in Baksa District which falls under Bodoland Territorial Autonomous Districts (BTAD) in Assam. The project envisages construction of 25 m high and 21 km long earth dam with a concrete spillway. The Government of India had sanctioned the project in January, 2001 at an estimated cost of ₹ 542.90 crore for construction by Brahmaputra Board.

- Works carried out since 2001
- Pre-construction survey, investigations, studies, design, drawings etc.
- Taking possession of land (956 ha) for Resettlement & Rehabilitation (R&R) purpose
- Construction of project roads, offices, etc.
- Preparation of technical specifications & tender document
- Pre-qualification of contractors for main works

The start of effective implementation of the project is dependent on two activities to be carried out by the State Government of Assam viz. (i) Zirat Survey (property assessment) of the Project Affected Families (PAF) for finalizing the Resettlement and Rehabilitation (R&R) Plan and (ii) land allotment / acquisition for R&R and project construction. These two activities could not be carried out due to the resistance from a section of the PAF. Even after vigorous efforts at

various levels upto Hon'ble Minister (WR) and others with Government of Assam, no headway has been achieved.

A meeting was held on 23rd Oct, 2009 in the conference room of the Chief Secretary, Govt. of Assam, wherein, the Board officials emphasized that it would be ideal if the dam could be constructed at Thalkuchi. However, as an alternate to this, possibility can be explored at the confluence of Pagladiya near Indo-Bhutan border. As the catchment areas fall within Bhutan, the matter would require to be taken up with Government of Bhutan through Ministry of External affairs, Govt. of India. The Brahmaputra Board has done reconnaissance survey and topographic survey upto the Indo-Bhutan border area (within Indian Territory) to explore the location of any possible dam site as proposed.

Subsequently, the possibility of an alternative dam site upstream of Thalkuchi was explored keeping into account that the resultant submergence fall within the Indian Territory. After examining the available reports for alternative sites in the upstream of Thalkuchi which was investigated earlier and incorporated in the Detailed Project Report (DPR) of Pagladiya Dam Project, it was opined that no suitable site is available in the upstream of Thalkuchi. The matter has been intimated to the Ministry of Water Resources.

11.0 Construction of Raised Platforms

16 raised platforms have been completed by Brahmaputra Board. One raised platform at Tulsimukh, Nagaon district, Assam is on the verge of completion.

12.0 North Eastern Hydraulic and Allied Research Institute (NEHARI)

North Eastern Hydraulic and Allied Research Institute (NEHARI) was established in the year 1996 under Brahmaputra Board, as a follow up of historic 'Assam Accord' inked on the auspicious day – 15th August (Independence Day of India) – in the year 1985 in presence of then, Hon'ble Prime Minister of India Late Rajiv Gandhi. The Institute is situated in sprawling campus of 44 ha at Rudreswar in North Guwahati at a distance of 25 km from the main city, far from the madding crowd of the city, on the hillock in a conducive ambient. The Institute was set up as pioneer laboratory of North Eastern Region for laboratory testing of soil, rock, concrete and construction materials for development of water

resources and other projects. The Institute has adequate facility for simulating / understanding river behavior through physical models.

Mandate

Undertaking field and laboratory investigations, research and development work of basic and applied types in 'Geo-mechanics', 'Concrete Technology', 'Soil Characteristics', 'Construction Materials' and associated issues for development of Hydropower, Irrigation, Flood Control Projects

Activities

- Hydraulic Physical Model Testing for Erosion problem study & River training
- Soil mechanics
- Rock mechanics
- Concrete technology
- Construction material testing
- Geophysical investigations at site
- Sediment/Silt analysis

NEHARI has patronage of Central Soil and Material Research station (CSMRS), New Delhi and Central Water and Power Research Station (CWPRS), Pune – Internationally reorganized as apex Institutes in the field of laboratory testing of soil and construction materials and development of physical and mathematical models in the field of development of water resources. Experts/technical hands of NEHARI have initially been imparted training on the subject by both the above mentioned premier Institutes. During this short span of time, since its inception, NEHARI has successfully completed laboratory testing of soil and materials during investigation and also during execution of a number of projects in the water resources development.

Noteworthy among them are Lower Subansiri Hydro-electric Project, Middle Subansiri Hydro-electric Project, Lower Siang Project, Middle Siang Project, Dibang Dam Project, Laskar Mintu Project of Meghalaya, Tuirini, Tuipal and Kolodyne H.E. Project of Mizoram, Dikhu Hydel Project of Nagaland and others. Test reports prepared by NEHARI have been appreciated by CSMRS.

13.0 Appraisal and Monitoring of Schemes under Flood Management Programme of Government of India

The Brahmaputra Board is entrusted with monitoring of scheme under Flood Management Programme in respect of entire North Eastern Region including Sikkim and part of West Bengal falling under Brahmaputra Basin since X Plan. Details of scheme undertaken by Government of India under Flood Management Programme and monitored by Brahmaputra Board is shown below –

o During X Plan

Sl. No.	Name of State	Nos of schemes	Central Grant released (₹ in crore)
1	Assam	44	78.8182
2	Arunachal Pradesh	7	16.3755
3	Manipur	4	7.911
4	Mizoram	3	6.1980
5	Tripura	7	12.7635
6	Meghalaya	2	2.635
7	Nagaland	1	3.897
8	Sikkim	3	8.595
9	West Bengal	3	9.01

o During XI Plan

Sl. No.	Name of State	Nos of schemes	Central Grant released (₹ in crore)
1	Assam	100	744.9
2	Arunachal Pradesh	21	78.77
3	Manipur	22	65.03
4	Mizoram	2	3.4
5	Tripura	11	20.91
6	Meghalaya	0	0
7	Nagaland	11	28.96
8	Sikkim	28	82.86
9	West Bengal	6	13.39

Initially appraisal of schemes under Flood Management Programme of Government of India was with Central Water Commission and monitoring of progress of such schemes was with Brahmaputra Board.

Subsequently, it was decided that appraisal as well as monitoring of Flood Management Programme schemes of North Eastern Region may be assigned to Brahmaputra Board. In pursuance to decision contained in letter No: 5/6/2011-RMCD/660-92 dated 1st February 2012. Brahmaputra Board undertook appraisal of schemes under Flood Management Programme. During joint visits of officials of Brahmaputra Board and Water Resources Departments, scopes of some of the schemes were changed and some proposals were even considered unnecessary after visit of project sites and thus dropped.

The appraisal of schemes under Flood Management Programme of Government of India was entrusted back to Brahmaputra and Barak Organization, Central Water Commission, Shillong through letter No: 5/6/2012-RMCD/4756-4824 dated 30.11.2012 by Central Water Commission.

Status on appraisal of schemes under Flood Management Programme initiated by Brahmaputra Board during the brief period February 2012 to July 2013 is tabulated below –

Sl. No.	Name of State	No. of schemes received	Appraised by Brahmaputra Board	Returned to State Government	Submitted to Regional office of CWC
1	Assam	87	60	4	23
2	Arunachal Pradesh	2	0	2	0
3	Manipur	0	-	-	-
4	Mizoram	0	-	-	-
5	Tripura	0	-	-	-
6	Meghalaya	6	0	1	5
7	Nagaland	1	0	1	-
8	Sikkim	44	34	10	0
9	West Bengal	11	6	4	1

The above are reasons and justifications for entrusting appraisal of Flood Management schemes to Brahmaputra Board. But, Brahmaputra Board does not have reasons for again transferring this responsibility of appraisal of schemes under Flood Management Programme back to Central Water Commission from Brahmaputra Board.

14.0 Establishment – Administration and Finance

The sanctioned and filled positions in Brahmaputra Board are furnished in the following table –

Sl. No.	Post	Sanctioned Post	Post filled up	Post vacant
1.	Group - A	81	64	17
2.	Group - B	186	178	8
3.	Group- C	358	306	52
Total		625	548	77

Brahmaputra Board is provided fund through grant-in-aid by the Central Government for its works and establishment. The Board has a Financial Advisor to render advice on all matters relating to revenue and expenditure, to maintain the accounts and to conduct internal audits of the Board. The Finance wing has altogether 32 sanctioned posts headed by Financial Adviser and supported by Deputy Financial Adviser, Senior Accounts Officer, Accounts Officers and other supporting staff to assist him in discharging his responsibilities. Each field division is provided with a Divisional Accountant to maintain proper accounts of field works and advise the Executive Engineers in accounts matters. The fund allocations to the divisions and their expenditure are maintained & controlled by the Finance wing on monthly/quarterly basis. The Adviser Finance also functions as Chairman of the Contributory Provident Fund Trust Accounts, constituted with approval of Government of India.

15.0 Restructuring of Brahmaputra Board

Constitution of India under Article 246 Entry 56 of the Union List (List 1) provides for regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest. Under these provisions, Brahmaputra Board was created under Brahmaputra Board (BB) Act of 1980 to undertake the development of the master plans for

the Brahmaputra Basin. A review of the functioning of the Brahmaputra Board reveals that it did not have a mandate to provide a strong framework for the holistic development of the Brahmaputra river basin with regard to the optimal utilization of land, water and other natural resources of the basin. Some of the shortcomings of the Brahmaputra Board which have been identified are as follows -

- Lack of mandate for basin level planning for integrated water resources development and management with a multi disciplinary approach
- Lack of ownership of the plans and programmes by the State Governments
- Overwhelming emphasis on flood and drainage works
- Need to build up competent engineering cadre to support the activities of the Board
- Apparent concentration of the work done by the Board in the State of Assam
- Non-inclusion of the political or stakeholder's will in the decision making

15.1 Change in the Water Governance in North-Eastern Region

This proposal seeks to restructure the existing Brahmaputra Board into a new entity to be called **Brahmaputra River Valley** [BRVA] (**Authority** for short). The Authority shall have a policy making Governing Council (**Council** for short) and an Executive Board (**Board** for short) which will be the executive agency. The Authority will take up integrated water resources planning and management in the Brahmaputra Basin in a comprehensive manner. The Authority is envisaged as an autonomous self contained entity with a mandate for the development, management and regulation of all the water resources related activities based in the NE region keeping the entire Brahmaputra River Basin as the unit for planning. It shall appraise and monitor water resources projects and take up implementation activities on need basis or on the specific request of any State Government in the North Eastern Region. The Authority is envisaged as a fast delivering mechanism for water resources management. The Authority will involve the top political executives of the North Eastern States in active participatory roles.

15.2 Review of the Brahmaputra Board Act 1980

The Brahmaputra Board Act 1980 established a Board to tackle the flood and drainage problems of NE India. The need for restructuring and strengthening of the Brahmaputra Board has been long felt to enable it to function more effectively for meeting the additional challenges. Members of Parliament, State Governments of North Eastern Region and Standing Committee of Parliament on Water Resources at different times have strongly expressed their demand for revamping of the Brahmaputra Board. A Task Force under the Chairmanship of Chairman, Central Water Commission was set up by the Ministry of Water Resources in August 2004, to suggest short term and long term measures for Management of floods and erosion control, had also inter-alia recommended the restructuring, strengthening and empowerment of the Board. Ministry of Water Resources constituted a Nodal Group in August 2011 under the Chairmanship of the Chairman, Central Water Commission with a mandate to recommend the manner in which Brahmaputra Board may be revamped into a complete basin organization incorporating within itself the current function of Central Water Commission in the North East region. The Nodal Group suggested the working structure for the strengthened organization. This proposed restructuring of the Brahmaputra Board therefore draws upon the wisdom that has accumulated during the last 31 years of its operation.

15.3 Establishment of the Authority

The mandate of the proposed Brahmaputra River Valley Authority shall be the co-ordinated development and management of water, land and related sources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of the vital ecosystem of the Brahmaputra Valley. The proposed Authority will have two parts, a policy making apex council and an executive wing. The Council shall be headed by Union Minister of Water Resources of the NE States, subject matter experts and other senior representative of the State and Central Government. One of the Chief Ministers shall be Vice-Chairman of the council on rotational basis in alphabetical order. The Executive Board will be responsible for implementing the decision of the council. The Authority shall be a body corporate by the name aforesaid having perpetual succession with powers to acquire, hold and dispose of property, both movable and immovable, and to contract and shall by the said name sue and be sued. The working relationship shall be modeled like.

The sphere of the work of the new Authority briefly as follows –

- Integrated Multi-disciplinary basin Planning ensuring their implementation by member states
- Investigation, Planning & Design, appraisal, clearance, monitoring and implementation of works in consultation with states
- Promotion of sustainable water resources management
- Integrated flood management, flood forecasting
- Hydro-power development to the extent provided for national interest

16.0 Plan Proposal for 12th Five Year Plan

The following is the gist of **Plan Proposal of Brahmaputra Board for implementation during the 12th Five Year Plan -**

Sl. No.	Description	Estimated Cost (₹ in crore)	Remarks
1	Protection of Majuli Island from flood and erosion Phase -IV	200.13	The proposal formulated based upon recommendations of 8 th visit of Standing Committee of Experts is under appraisal in Central Water Commission.
2	'Conversion of the existing tie bund across the spill channel of river Dibang from chainage 480.00 m to chainage 2550.00 m in to a full-fledged embankment at Bahbari'	9.22	
	'Restoration of original channels of Dibang and Lohit Rivers at Dhola-Hatighuli' Phase-V	309.71	
3	Protection of Balat Village in Meghalaya on River Umngi	10.18	Techno-economic clearances from CWC and requisite undertaking (NOC) from the State Governments for implementation have been received.
4	Anti-erosion works for protection of Mankachar, Kalairalga international border area from erosion of river Brahmaputra Assam	23.79	
5	Anti-erosion measures in Maslabari in Assam near International Border	5.76	
6	Anti-erosion measures in Bhajaner Charra, Cooch Behar, West Bengal	4.90	
7	Bank Protection work in Bhogdebri area, Cooch Behar, West Bengal	5.39	