

SL-3311)

संख्या: /BB/9005/03/Vol-XII/941-942

भारत सरकार

Government of India

जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्रालय

Ministry of Water Resources,

River Development and Ganga Rejuvenation

ब्रह्मपुत्र बोर्ड

Brahmaputra Board

Basistha, Guwahati -29

Dated December 10, 2015

To

Shri Ram Swarup
Director (E-III)
Ministry of Water Resources, RD&GR
6th Floor, Shram Shakti Bhawan
Rafi Marg, New Delhi-110 001

Sub: VIP reference dated 11.11.2014 received from Shri Nabum Tuki, Hon'ble Chief Minister of Arunachal Pradesh regarding restructuring of Brahmaputra Board

Sir,

Kindly refer to MoWR, RD&GR letter No. X-20/2014-B&B(E.III) dated 14.09.2015 on the subject cited above. As desired therein, the activities of Brahmaputra Board in Arunachal Pradesh and a Note on Need for Integrated management of floods in Brahmaputra Valley is enclosed for favour of needful please.

Encl: As above

Yours faithfully,

(J. C. Majumdar)

Executive Engineer (H.Q.)

Copy to:

The Commissioner (B&B), Ministry of Water Resources, RD&GR, 2nd Floor,
Block-3, C.G.O. Complex, Lodhi Road, New Delhi-110 003

Executive Engineer (H.Q.)

o/c

Activities of Brahmaputra Board in Arunachal Pradesh

1. Constitution of Brahmaputra Board

Brahmaputra Board was constituted in the year 1980 by an Act of Parliament (Act 46 of 1980 called "The Brahmaputra Board Act, 1980") with the objective of planning and integrated implementation of measures for control of floods and bank erosion and improvement of drainage in Brahmaputra and Barak Valley and development of Water Resources in the region. It started functioning since January 11, 1982 with headquarters at Guwahati, Assam. As per notification in the 'The Gazette of India' dated 29th May 1982, jurisdiction of Brahmaputra Board included States of Arunachal Pradesh, Assam, Meghalaya, parts of the states of Manipur, Mizoram, Nagaland and Tripura. The jurisdiction has further been extended through notification in 'The Gazette of India' dated 18th December 2005 to cover entire area of North Eastern Region, Sikkim and Northern part of West Bengal falling within the Brahmaputra and Barak Basin.

The Plan wise activities of Brahmaputra Board in the State of Arunachal Pradesh are as under-

2. Activities undertaken during VI Five Year Plan (1982-87)

During the VI Five Year Plan, the following main activities were taken up by Brahmaputra Board-

2.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

Immediately after formation, Brahmaputra Board undertook 'Survey & Investigation' for major multipurpose projects on the important tributaries of Brahmaputra. The field investigations for two major multipurpose projects- Dihang (Siang) Dam Project and Subansiri Dam Project - with substantial cushion for flood moderation were taken up by Brahmaputra Board. Investigations of these projects were first started by the Government of Assam in the year 1974. Based upon 'Survey & Investigation', Detailed Project Reports for both the projects were completed and submitted to the Government of India by Brahmaputra Board in July, 1983.

Flood Moderation Study carried out by Brahmaputra Board has confirmed that with creation of Dihang Storage Project alone, maximum flood peak may get reduced from 73000 cumec to 43000 cumec in Brahmaputra at Guwahati. Reduction in Water Level to the extent of 1.75m and 0.60m respectively in Brahmaputra River at Guwahati may be attainable on creation of Dihang and Subansiri Projects.

'Survey & Investigation' of other major multipurpose water resources projects such as Lohit, Noa-Dihing and Dibang in Arunachal Pradesh were also simultaneously taken up by Brahmaputra Board.

3 Activities during VII Five Year Plan (1987-92)

During the VII Five Year Plan, Brahmaputra Board carried out the following main activities-

3.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

Brahmaputra Board continued 'Survey & Investigation' for Dihang (Siang), Subansiri and Lohit Dam Projects.

4 Activities during VIII Five Year Plan (1992-97)

During the VIII Five Year Plan period, Brahmaputra Board carried out the following main activities in Arunachal Pradesh –

4.1 Inception reports of Kameng, Subansiri (alternate proposal), Dihang (alternate proposal), Lohit, Dibang and Noa-Dihing Projects were completed during the Plan period. Joint Inspection Team comprising of officials of Central Water Commission (CWC), Geological Survey of India (GSI), Brahmaputra Board and concerned State Governments visited all these project sites and finalized layouts.

5. Activities during IX Five Year Plan (1997-2002)

Brahmaputra Board carried out the following main activities during IX Five Year Plan –

5.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

At the behest of Prime Minister's Office (PMO), the completed DPRs of Dihang (Siang) Dam Project and Subansiri Dam Project of Arunachal Pradesh were handed over to the National Hydro-electric Power Corporation (NHPC)

6. Activities During X Five Year Plan (2002-2007)

During the X Five Year Plan period, Brahmaputra Board carried out the following main activities-

6.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

'Survey & investigation' for 5 (five) Multipurpose Projects of Arunachal Pradesh, as named below, was continued during the X Five Year Plan-

1. Lohit Dam Project
2. Noa-Dihing Dam Project
3. Dibang Dam Project
4. Kameng Dam Project
5. Jiadhul Dam Project

Dibang Dam Project was transferred to National Hydroelectric Power Corporation (NHPC) at the behest of Prime Minister's Office (PMO). Investigation

of Kameng Dam Project was stopped on account of withdrawal of Forest Clearance by the Government of Arunachal Pradesh.

6.2 Critical Anti-erosion Schemes in Arunachal Pradesh

During X Five Year Plan, Cabinet Committee on Economic Affairs (CCEA) sanctioned an amount of ₹ 150 crore for implementation of flood management / Anti-Erosion works in Brahmaputra and Barak Valley - all North Eastern (NE) States including Sikkim and North Bengal. The allocation was, latter on, enhanced to ₹ 225 crore. During X Five Year Plan, a total of 74 schemes of all 9 riparian States of Brahmaputra and Barak River System were taken up with an estimated cost of ₹ 407.98 crore.

An amount of ₹ 146.20 crore was released against 74 schemes was released during X Five Year Plan as 'Central Share', **out of which ₹ 16.37 crore was released against 7 schemes of Arunachal Pradesh.**

7. Activities during XI Plan (2007-2012)

During the XI Five Year Plan period, Brahmaputra Board carried out the following main activities-

7.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

During XI Five Year Plan, Government of Arunachal Pradesh entrusted Lohit Project to Private Developer and Brahmaputra Board had to stop all activities under 'Survey & Investigation' of the project. 'Survey & Investigation' for 2 Multipurpose Projects - (1) Noa-Dihing Dam Project (2) Jiadhul Dam Project were continued in Brahmaputra Board.

7.2 Flood Management Programme (FMP) under State Sector

During XI Five Year Plan (2007-12) in November, 2007, Government of India approved "Flood Management Programme" - a State Sector scheme under Central Plan - to provide 'Central Assistance (CA)' to State Governments, amounting to ₹ 8000 crore for taking up river management, flood control, anti-erosion, drainage development, flood proofing and restoration of damaged flood management works and other such works. Proposals under this programme for the North Eastern (N.E) States were vetted / recommended to Ministry of Water Resources (MoWR) by Brahmaputra Board and progress of works under this programme was also monitored by Brahmaputra Board. The details of schemes under Flood Management Programme against Arunachal Pradesh up to 31st March 2012 is furnished below-

Sl. No.	Name of state	No of Schemes	Central Assistance released during XI Plan (₹in crore)

Sl. No.	Name of state	No of Schemes	Central Assistance released during XI Plan (₹in crore)
1	Arunachal Pradesh	21	78.77

Out of 21 schemes, 11 schemes were completed during XI Five Year Plan and 10 schemes were continued to XII Five year Plan

8. Activities During XII Five Year Plan (2012-2017)

Important activities undertaken / planned to be undertaken by Brahmaputra Board during the XII Five Year Plan are as follows –

8.1 'Survey & Investigation' and Preparation of Detailed Project Reports for Water Resources Projects

'Survey & Investigation' for 2 Multipurpose Projects namely - (1) Noa-Dihing Dam Project, (2) Jiadhhal Dam Project, in Arunachal Pradesh is continued in Brahmaputra Board.

Government of India has identified three Water Resources Projects – Kushi Dam Project, Noa-Dihing Dam Project and Siang Dam Project – as National Projects out of 14 Projects selected as National Projects all over the country. Out of above three projects, two projects - Kushi Dam Project and Noa-Dihing Dam Project- are under 'Survey & Investigation' in Brahmaputra Board. Detailed Project Reports in respect of Noa-Dihing Dam Project located at Miao, Arunachal Pradesh has been prepared by Brahmaputra Board and submitted to MoWR, RD & GR during April, 2014. The Details of the Noa Dihing Dam Project is as below-

8.2 Noa-Dihing Dam Project

The Project site is located about 4 km upstream of Miao Town in Changlang District, Arunachal Pradesh. Noa-Dihing Dam Project is envisaged to generate hydropower with installed capacity of 71 MW and irrigation to 8000 ha of Gross Command Area (GCA) in Arunachal Pradesh on right bank of Noa- Dihing River.

8.3 Jiadhhal Dam Project

The Project site is located about 6 km upstream of Jiadhalmukh in North Lakhimpur District in Assam on its border with Arunachal Pradesh. Jiadhhal Dam Project is envisaged to generate hydropower with installed capacity of 70 MW. The Survey & Investigation of the project is continued under of Brahmaputra Board.

8.4 Flood Management Programme (FMP) under State Sector

During XII Five Year Plan, Brahmaputra Board has been given additional responsibility of appraisal of schemes formulated by States under Flood Management Programme (FMP) of Government of India.

Total 151 Schemes under this category were received from States. Out of the total 151 schemes, 2 schemes were received from Government of Arunachal Pradesh and returned for compliance of observations.

9.0 Achievements at a Glance

- Board has prepared Detailed Project Reports of mega projects like Dihang (Siang) Dam Project and Subansiri Dam Project in a record period of time. Feasibility for cascade of dams on Siang and Subansiri Rivers was explored. 'Survey & Investigation' for preparation of 'Detailed Project Reports' for cascade of dams was started by Brahmaputra Board. These projects were subsequently handed over, on decision of Government of India, to National Hydroelectric Power Corporation (NHPC) for implementation. Similarly, preliminary tasks such as preparation of pre-feasibility and feasibility reports and initiation of 'Survey & Investigation' in respect of several other projects in the field of water resources - Dibang, Lohit Dam Projects -were taken up by Brahmaputra Board. These projects were also handed over by the State Governments in the midway to private developers. Thus, Brahmaputra Board had to abandon further investigation in respect of these projects.

- Government of India has identified three Water Resources Projects – Kushi Dam Project, Noa-Dihing Dam Project and Siang Dam Project – as National Projects out of 14 Projects selected as National Projects all over the country. Out of above three projects Detailed Project Reports in respect of Noa-Dihing Dam Project was submitted *during April, 2014* for techno-economic clearance. The DPR is under examination at CWC

Note on Need for Integrated management of floods in the Brahmaputra Valley

Brahmaputra River System

The Brahmaputra rises just south of the lake Konggu Tsho in Tibet, very near the Manasarover lake at an elevation of 5150 m. The river flows through southern Tibet for about 1700 km eastwards and parallel to the main range of Himalayas. The river turns to north and flows in a succession of rapids between the high mountains and turns to the south and south-west to emerge from the foothills of Arunachal Pradesh first under the name of Siang and then as Dihang. Flowing southwards it enters Assam valley, west of Sadiya town where two important tributaries, the Debong and Lohit join the river. Thereafter, it is known as the Brahmaputra. The mighty river then rolls down the Assam valley from east to west for a distance of about 720 km, its many channels meandering from side to side and forming numerous braids creating many islands. In this reach it receives from the north the Jiadhal, the Subansiri, the Kameng, the Dhansiri, the Puthimari, the Pagladiya, the Manas, the Champamati, the Saralbhanga and the Sankosh. The important south bank tributaries are the Noa-Dihing, the Burhi-Dihing, the Disang, the Dikhu, the Jhanji, the Dhansiri (south) and Kopili.

Thereafter the river swings round the spurs of the Garo hills near Goalpara and enters Bangladesh. The Brahmaputra in its entire range length is braided consisting of several channels except in stretches where confined by natural constrictions. The behavior of Brahmaputra is quite complex in nature. Both banks of the river are under stretch and subjected to acute erosive activity of the river. The tributaries of the Brahmaputra have widely divergent characteristics. The north bank has very steep slopes and shallow braided channel. They have coarse sandy beds and carry heavy silt load and bring flash floods because of the short distances between their source in the hills and the confluence. Whereas the south bank have comparatively flatter grades and deep channel the beds and banks are composed of more clayey component carrying comparatively low silt load.

Brahmaputra Board was charged with the responsibility of preparing a Master Plan for control of floods and bank erosion and improvement of drainage in the Brahmaputra and Barak Valleys. In preparing the Master Plan, the Board was required to pay due attention to the harnessing of the water resources of these rivers for hydropower, irrigation, navigation etc. Accordingly, an integrated basin development approach has been adopted in preparing the Master Plan. The Master Plan of Brahmaputra Basin, Part-I (Main Stem) was prepared by Brahmaputra Board and approved by the Government of India in 1997. The Master Plan was prepared with thorough detailed studies of Master Plans prepared at that time and all shortfalls found was attended in this Master Plan by including detailed data and studies of previous reports of committees constituted for control of floods in Brahmaputra Basin and in consultation with persons specialised and expert in Water Resources of eminent.

Bearing the above objectives, the recommendations included in the Master Plan of Brahmaputra Basin as under:

Brahmaputra has a propensity to inflict enormous damage by flooding and erosion of its banks. Yet it has the capacity to bestow large benefits in the shape of hydropower, navigation and irrigation. An integrated approach should, therefore, be adopted in formulating schemes for water resource development in the basin

Hydrometeorology

1. The rain-gauge network of the Brahmaputra basin should be extended and strengthened by installing additional ordinary and self-recording rain-gauges to bring it to WMO standard.
2. For controlling silt in the Brahmaputra not only soil conservation measures have to be taken in the catchment area but also storage reservoirs have to be created in the upper reaches.
3. Hydrological observations in the main river and its tributaries should be extended and strengthened. All the sites should be provided with modern equipment for observation and telecommunication system.

Geology

1. Geomorphological study should be taken up in a systematic manner and programme for such studies should be drawn in consultation with the Geological Survey of India.
2. A network of micro earthquake recording stations should be planned and set up for regular observation of earthquakes for planning and designing of various projects including stabilization of hill slopes.

Floods

1. Flood plain zoning of riparian land is called for. Rules and regulations for enforcement of zoning should be formulated and reviewed from time to time.
2. A basin-wise study for flood forecasting network should be made and the network should be made and the network suitably modernized to increase the warning time.
3. The use of INSAT (B) should be considered for improving the present ground level communication and manually controlled wireless network system for flood warning. This should be as a stand by channel of communication in the first instance.

Erosion

1. Studies of river behaviour and river channel processes should be undertaken for understanding reasons for erosion and bank migration with the help of aerial photographs and satellite imageries.
2. For reducing excessive silt load in the river, watershed management on extensive scale is necessary. The reservoirs would help in trapping the residual silt.
3. For evolving effective anti-erosion measures, study of the river reaches from one nodal point to the other should be undertaken with the help of model experiments.
4. The effects of various anti-erosion measures should be studied under prototype.
5. A large number of scientific studies are to be conducted and major projects planned in this region. Training programme for river and hydraulic research, material testing, computer analysis and design of structures should be chalked out and intensive training should be given to the technical staff. The officers and staff should also be given periodical training in management of both personnel and material by organizing training course.

Embankments

1. The existing embankments should be checked for raising and strengthening to make them conform to the prescribed standard. New embankments should be constructed to these standards and adequate provision made for the protection of the threatened reaches against erosion.
2. Embankments should be designed for urban and strategic locations for 100-year flood and in other cases for 25-year flood; and checked against overtopping for the maximum observed flood if it is higher
3. Priority reaches needing early attention may be identified.
4. Unless flood control or flood moderation by a reservoir is visualized in the near future alternative flood control works should continue to be taken up to provide relief to the extent possible.
5. Construction of embankments for closing the gap may create drainage problem on the countryside and this aspect should be examined in detail before undertaking such works.

Drainage

1. A periodic review of the existing waterway of bridges and culverts both on the railway and roads and of channels is necessary. Any new proposals should ensure adequate waterway.
2. There is need to enforce the Assam Embankment and Drainage Act 1962, more strictly to prevent encroachment on drainage channels.
3. It is not necessary to drain out the bills completely to bring land under cultivation. They should be retained for pisciculture which is more remunerative.
4. Schemes for reclaiming peripheral lands of bills with or without pumping for cultivation should be investigated and implemented.

5. The present practice in the various States is to provide waterway in drainage sluices for twice the design discharge of the drain and this should be adopted in Assam also.
6. Drainage problems arise not from rain storms alone but also from spills from adjoining streams. In designing drains these spills should be taken into consideration.
7. Identified drainage congested areas should be individually examined and proposals framed to suit the local conditions. Diversion of water, drainage sluice and small detention reservoirs wherever feasible may be considered.

Environment, Ecology and Watershed Management

1. For scientific management of catchment areas comprehensive plan for watershed management should be prepared for each sub-basin and an integrated approach of all the three disciplines, namely, agriculture, forestry and engineering should be adopted.
2. For effective watershed planning, trained organization for survey, investigation and programme formulation should be set up.
3. Watershed treatment should be given priority where the population is high and there is heavy degradation of forests.

The programme of watershed management and soil conservation in the catchment area should precede the taking up of a storage scheme to provide maximum benefit.
4. In rehabilitation programme for jhumias, the cultivators should provide free labour to inculcate a sense of participation which would go a long way in their attachment to the new holding.
5. The impact of development activities on the ecosystem needs to be studied in order to take remedial measures to maintain the balance.
6. The loss of vegetal species as also that of endangered animal species including birds should be studied and suitable measures taken for their preservation and rehabilitation.

Storage Dams

1. For multipurpose reservoir projects their effect on ecological balance in the vicinity and on the river regime downstream should be taken into consideration. Adequate measures for restoring the ecological balance should be provided for.
2. Pilot watershed management schemes should be prepared for both the Dihang and the Subansiri catchment area in the vicinity of the proposed reservoirs. Work on both can start simultaneously.
3. In a multipurpose project, the advance action in respect of rehabilitation and setting up new settlements should provide for among other things, facilities like irrigation, water supply, roads, electricity, hospitals, schools, colleges and vocational training centres.

4. In view of the flood damage that occurs in the Brahmaputra valley year after year and the pressing need for economic development of the region, it is urged that the Siang (Dihang) dam and the Subansiri dam projects should be implemented early.
5. The Siang (Dihang) and the Subansiri Dams have been investigated in detail and project reports of these multipurpose dams have been prepared and submitted to the Government of India in 1983.
6. Both the Dihang and the Subansiri reservoir will appreciably moderate floods in the Brahmaputra. The Dihang reservoir has a live storage capacity of 3.55 m ha m out of an average annual runoff of 17.90 m ha m. The Subansiri reservoir is smaller and has a live storage capacity of 1.00 m ha m out of an average runoff of 5.27 m ha m. The Dihang reservoir would substantially moderate floods in entire length of the river in the valley whereas the reservoir on the Subansiri would afford full protection in its own valley but relatively less benefit in the Brahmaputra.

A study of the scope of flood moderation by Dihang and certain other dams was undertaken by the Indian Institute of Management, Bangalore based on data supplied to it. Since then, the parameters changed and further studies were entrusted to CWPRS, Pune. Its study based on the stipulation that the water level in the Dihang reservoir would be brought down to MDDL on 1st May and then raised to FRL 430m by the end of October, has revealed that the peak of 1962 flood at Guwahati would get reduced from the natural peak of 73,000 cumecs to 43,000 cumecs. The percentage reduction in the upper reaches of the river will be larger. The reduction is substantial and should give considerable relief to the flood prone areas of the valley. It is seen from these studies that the reduction in peak flood heights at Pandu in 1976 and 1977 respectively would be (a) 1.75m and 0.60m with the Dihang dam alone in position (b) 0.60 m and 0.30 m with Subansiri dam in position and (c) 2.15m and 0.75m with both the Dihang and Subansiri dams in position.

Hydro power

1. Because of its reliability, suitability for peaking purpose and economy, hydropower should be accorded priority over other modes of power generation, where hydropower potential is available.
2. Development of hydropower in the North Eastern Region should be given priority over other regions because it is available in abundance at much cheaper cost.
3. The possibility of utilizing maximum power by development of powerbase industry in the region should be explored. Economical system for transfer of surplus bulk power to adjoining region should be developed.

Irrigation

1. On perennial tributaries, irrigation schemes utilizing river flows without storage dams should be investigated and considered in the first instance. There is

ample scope for construction of small storage reservoirs for development of irrigation which should be investigated.

2. Investigations of irrigation projects should be thorough and must not be abridged or curtailed in an endeavor to produce a project report speedily.
3. All irrigation schemes must provide for adequate drainage.
4. In Arunachal Pradesh, surveys and investigations for the conjunctive development of land and water resources should be pursued with vigour to discourage 'jhuming' and to popularize improved agriculture practices. In Meghalaya and Nagaland there is need for development of settled cultivation with adequate irrigation facility to discourage 'jhuming'.
5. The groundwater potential in this region should be developed for utilization along with surface water.

Navigation

1. Water transport being cheap, employment intensive and economical in energy consumption should be promoted to the extent feasible.

Multidisciplinary activities from different Departments / Organisations to be involved for implementation of the above recommendations contained in the Master Plan. An integrated approach is therefore obligatory to attain the goal of preparation of Master Plan for mitigation of flood problem of Brahmaputra Basin.