

**STANDING COMMITTEE ON WATER RESOURCES
(2013-2014)**

FIFTEENTH LOK SABHA

MINISTRY OF WATER RESOURCES

REVIEW OF GANGA FLOOD CONTROL COMMISSION

TWENTY FIRST REPORT



**LOK SABHA SECRETARIAT
NEW DELHI**

February, 2014/Phalguna, 1935 (Saka)

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(2013-2014)

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MINISTRY OF WATER RESOURCES

REVIEW OF GANGA FLOOD CONTROL COMMISSION

Presented to Lok Sabha on 20.02.2014
Laid on the Table of Rajya Sabha on 20.02.2014



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NEW DELHI**

February, 2014/Phalguna, 1935 (Saka)

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W.R.C. No. 45

Price : Rs.

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Published under Rule 382 of the Rules of Procedure and Conduct of Business
in Lok Sabha (Fourteenth Edition)

COMPOSITION OF THE STANDING COMMITTEE ON WATER RESOURCES (2013-2014)

Shri Dip Gogoi - Chairman

LOK SABHA

2. Shri Kameshwar Baitha
3. Shri Kamlesh Balmiki
4. Smt. Raj Kumari Chauhan
5. Dr. Mahendrasinh P. Chauhan
6. Smt. Shruti Choudhry
7. Shri Badri Ram Jakhar
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RAJYA SABHA

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28. Shri A.V. Swamy
29. Smt. Wansuk Syiem
30. Vacant
31. Vacant

* Nominated w.e.f. 09.09.2013

** Expired on 04.12.2013

SECRETARIAT

- | | | | |
|----|------------------------|---|---------------------|
| 1. | Shri Devender Singh | - | Joint Secretary |
| 2. | Shri Pawan Kumar | - | Director |
| 3. | Smt. Rita Jaikhani | - | Additional Director |
| 4. | Shri Ginsuanlian Guite | - | Committee Officer |

INTRODUCTION

I, the Chairman, Standing Committee on Water Resources (2013-2014) having been authorized by the Committee to submit the report on their behalf, do present the Twenty First Report on 'Review of Ganga Flood Control Commission'.

2. The Committee (2008-2009) was the first to take up the subject 'Ganga Flood Control Commission' for detailed examination and Report. The succeeding Standing Committees on Water Resources for the years 2009-2010 and 2011-2012 decided to continue with the examination of the subject. The Standing Committees on Water Resources for the year 2012-2013 and 2013-2014 again decided to continue with the examination of the subject as "Review of Ganga Flood Control Commission".

3. The Committee were briefed by the representatives of the Ministry of Water Resources on the subject at their sittings held on 21 November 2008, 14 July 2010 and 20 July 2012. The Committee also took oral evidence of the representatives of the Ministry of Water Resources on various aspects of the subject at their sitting held on 18 October 2013.

4. The Committee at their sitting held on 18 February 2014 considered and adopted the Report.

5. The Committee wish to express their thanks to the representatives of the Ministry of Water Resources for providing them the requisite written material, and for oral depositions in connection with the examination of the subject.

6. The Committee would also like to place on record their sense of deep appreciation for the assistance rendered to them by the officers of the Lok Sabha Secretariat attached to the Committee.

NEW DELHI;
18 February, 2014
29 Magha, 1935 (Saka)

DIP GOGOI,
Chairman,
Standing Committee on Water Resources

REPORT
PART - I
CHAPTER-I
INTRODUCTORY

The Alaknanda and the Bhagirathi, originating in the Garhwal Himalayas at an altitude of 7000 metres unite at Devprayag, Uttarakhand and form the Ganga. The 'Ganga' traverses its course of 2,525 kms. (1,450 kms. in Uttar Pradesh including Uttarakhand, 110 kms. along Uttar Pradesh – Bihar border, 445 kms. in Bihar and Jharkhand, and 520 kms. in West Bengal) to its outfall into the Bay of Bengal. The important tributaries which join the Ganga in its course are the Ramganga, Gomati, Ghaghra, Gandak, Burhi Gandak, Kosi, Kamla, Bagmati and Mahananda on the left and the Yamuna, Tons, Sone, Kiul, Ajoy, Damodar, Punpun and Rupnarayan on the right.

1.2 The river Ganga is a most sacred river to the Hindus. It also plays vital role in providing water for irrigation, drinking, industrial usage, etc., for overall development of the people of the region. It provides a perennial source of fresh water for agriculture, fisheries and rich bio-diversity. A broad analysis of Reserve Bank of India (RBI)'s data for food grain production during 2000-01 to 2010-11 reveals that the food grain output in the Ganga basin during the period was in the range of 48 to 54 percent of the national food grain production, whereas its catchment area is only 31 percent of the total catchment area of all the basins in the country.

1.3 Ganga basin is spread over 11 States, namely Uttarakhand, Himachal Pradesh, Haryana, Delhi, Uttar Pradesh, Rajasthan, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, and West Bengal. The Ganga basin is divided into 23 river systems. The river systems of the basin are (1) Gomti (2) Adhwara Group (3) Ghaghra (4) Mahananda (5) Kamla Balan (6) Burhi Gandak (7) Bagmati (8) Punpun (9) Kosi (10) Gandak (11) Ajoy (12) Kiul-Harohar (13) Damodar (14) Mayurakshi (15) Yamuna (16) Ramganga (17) Tons (18) Badhua-Chandan (19)

Rupnarain-Haldi-Rasulpur (20) Jalangi (21) Sone (22) Tidal rivers and (23) Main Ganga Stem.

About 50 percent of the total flood-prone area in the country is in the Ganga basin itself.

1.4 The issue relating to status/inclusion of Chambal river system, which is a major river of Rajasthan, in the Ganga basin system, was raised at the sitting of the Committee on 18.10.2013. The Ministry in a written reply has stated as under:

"A Committee under the Chairmanship of Chairman GFCC & Member (RM), Central Water Commission (CWC) considered the issue and noted that the river systems have been defined on the name of rivers directly draining into main stem of river Ganga with a few exceptions based on overriding criteria of flood damage. It was decided that, the 'Yamuna River System' should be renamed as 'Yamuna-Chambal-Ken-Betwa River System'."

1.5 The Government of India set up the Ganga Flood Control Board (GFCB) in 1972 to deal with the chronic flood problems of the Ganga basin. In the same year (1972), the Ganga Flood Control Commission (GFCC), a subordinate office of Ministry of Water Resources (MoWR) was also created to act as the Secretariat and executive limb of Ganga Flood Control Board (GFCB) and to deal with the floods and its management in Ganga basin States.

1.6 The Committee's examination of the subject 'Review of Ganga Flood Control Commission' *inter-alia* include review of the Flood Scenario in Ganga basin States; Ganga Flood Control Commission; Implementation of Works for Flood Protection and Management; Monitoring, Evaluation and Appraisal of Schemes and Utilisation Certificates; and Cooperation with Neighbouring Countries. Further, other related aspects, including the views of the Ministry have been dealt with in the succeeding chapters of this Report.

CHAPTER-II

FLOOD SCENARIO IN GANGA BASIN STATES

(i) Drainage, Utilisable Water Resource and Annual Discharge of River Ganga

The river Ganga is the master drain of the Ganga basin States. It drains a total catchment area of 10.68 lakh sq. km., out of which 8.61 lakh sq. km. lies in India, thus draining 26 percent area of India. The Ganga and the Brahmaputra basins carry nearly 60 percent of the water which are available every year to the country.

2.2 As per the National Commission on Integrated Water Resources Development and Planning (NCIWRDP), the annual average flow of Ganga basin is 525.02 Billion Cubic Metre (BCM). Out of this, the utilizable water resource has been assessed to be around 250 BCM. The available annual flow of river Ganga as observed at Farakka site by Central Water Commission (CWC) is given in table 2.2.

Table 2.2 : AVAILABLE ANNUAL FLOW OF RIVER GANGA AT FARAKKA (SINCE 1960)

Annual Flow of Ganga d/s of Farakka Barrage				(in Million Cubic Metre)	
Year	Monsoon	Non-Monsoon	Annual Runoff (MCM)	Annual flow in Feeder Canal at Farakka since 1975	Total annual flow of river Ganga at Farakka
1	2	3	4	5	6
1960-61	335695.614	64097.222	399792.836		399793
1961-62	421337.667	87131.620	508469.287		508469
1962-63	371103.939	57192.157	428296.096		428296
1963-64	314530.394	63985.327	378515.722		378516
1964-65	326784.385	60756.283	387540.668		387541
1965-66	214165.578	50832.833	264998.410		264998
1966-67	230460.520	42127.129	272587.649		272588
1967-68	309214.306	50941.711	360156.017		360156
1968-69	265504.836	46061.285	311566.122		311566
1969-70	317460.749	56196.307	373657.056		373657
1970-71	311369.944	52378.766	363748.711		363749
1971-72	487550.880	70697.391	558248.271		558248
1972-73	191189.732	46954.000	238143.732		238144
1973-74	368381.576	63692.877	432074.453		432074
1974-75	294667.667	48912.224	343579.890		343580

1975-76	403552.879	42032.246	445585.126	30939	476525
1976-77	328452.482	30988.518	359441.000	31450	390891
1977-78	342720.472	45151.682	387872.154	33371	421243
1978-79	443541.045	46755.058	490296.103	31764	522060
1979-80	187571.742	24185.414	211757.156	27157	238914
1980-81	438196.903	35748.092	473944.994	31589	505534
1981-82	332953.506	34639.428	367592.933	32708	400301
1982-83	301268.551	32610.179	333878.730	31635	365514
1983-84	300472.537	43105.488	343578.025	34052	377630
1984-85	332470.545	29791.944	362262.489	31734	393997
1985-86	365311.140	63210.135	428521.276	35110	463631
1986-87	300156.441	35999.719	336156.159	32543	368699
1987-88	328285.214	35905.477	364190.691	30342	394533
1988-89	335693.927	32823.550	368517.477	33963	402481
1989-90	272266.420	30420.723	302687.143	35205	337892
1990-91	365542.121	37056.779	402598.900	33724	436323
1991-92	310166.147	26654.910	336821.057	31088	367909
1992-93	191729.623	25977.045	217706.668	28112	245819
1993-94	278682.464	37432.932	316115.396	30908	347023
1994-95	328045.974	31080.612	359126.586	33793	392920
1995-96	296085.821	40140.943	336226.764	34479	370706
1996-97	338817.049	33260.064	372077.113	32791	404869
1997-98	278094.895	58567.469	336662.363	35733	372396
1998-99	376592.996	57981.798	434574.793	36094	470669
1999-2000	335668.745	54249.365	389918.110	34639	424557
2000-01	338195.864	38058.920	376254.784	32548	408802
2001-02	300165.083	43599.647	343764.730	35097	378862
2002-03	210601.464	32264.548	242866.012	35945	278811
2003-04	338824.655	50693.357	389518.013	34542	424060
2004-05	215465.624	33287.126	248752.750	33308	282060
2005-06	217857.401	33668.768	251526.169	32878	284405
2006-07	203192.842	30429.931	233622.772	34591	268214
2007-08	281557.320	36824.469	318381.789	33501	351883
2008-09	198085.485	36199.420	234284.906	33239	267524
2009-10	170087.205	29563.953	199651.158	33331	232982
2010-11	221158.711	33594.836	254753.547	33453	288207
2011-12	308423.715	47597.153	356020.867	32933	388953

Average : 372484

The Ministry informed that information regarding State-wise percentage usages for irrigation and hydroelectric power in Ganga basin area is not available with the Ministry of Water Resources.

2.3 When asked whether there has been a change (increase or decrease) in total annual discharge of river Ganga since 1947, the representative of the Ministry informed the Committee that the data pertaining to available annual flow of river Ganga as observed at Farakka site do not establish any statistically significant trends.

2.4 The Ministry further informed the Committee that the flood discharge at Kolkata, is about 77,000 cubic metre per second (cumecs). On being asked about the total volume of water discharge which can be arrested and utilised rather than wasted in respect of Ganga basin rivers, the Ministry in a written reply submitted as under:

"The total water resource of the Ganga basin is estimated to be 525.02 BCM. Out of this, the utilisable surface water of the basin is 250.00 BCM. With the creation of storage capacity of 48.68 BCM in the basin, water utilisation at present can be estimated to be of the order of 63.28 BCM. Therefore, about 186.72 BCM of water, out of the estimated utilisable surface water, is going to neighbouring country, which could be arrested. An additional storage of 7.65 BCM would be created through projects under construction in the basin, which will increase water utilisation of the basin by 9.95 BCM."

2.5 The Ministry in a written reply *inter-alia* submitted that this storage can be, to some extent, useful for cushioning the floods.

2.6.1 Asked further to state whether there is any scope to further arrest the water discharge from Ganga basin rivers into the sea, and also the measures envisaged by the Ministry in this regard, including building of storages/reservoirs on river waters, the Ministry submitted as under:

"Water discharge from Ganga basin rivers into neighbouring country/sea in 'non lean season' can be arrested with the help of creating sufficient storages in upper catchment and transferring water from the water-surplus river basins to the water-deficit river basins. For which, implementation of dams at suitable locations and development of

identified and feasible Inter-Links of Rivers (ILRs) is required to be undertaken. The Government of India has declared some of the potential sites of the basin in India as National Projects such as Renuka, Kishau and Lakhwarvysi dam projects for their expeditious completion. However, there are difficulties in implementation of such dams due to environmental angle and Resettlement & Rehabilitation (R&R) issues etc."

2.6.2 On the question of talks with Nepal, the Ministry submitted:

"The Government of India is also in continuous dialogue with Nepal for having storage projects in Nepal on the rivers coming from Nepal. The projects, namely Pancheshwar Multipurpose Project, Sapta Kosi High Dam Multipurpose Project, Sun Kosi Storage-cum-Diversion Project, Kamala Dam Project and Bagmati Project in Nepal have been identified, which are at conceptualisation stage only. The field investigations for Pancheshwar Multipurpose Project have been done. A Pancheshwar Development Authority (PDA) for implementation, execution and operation of the Pancheshwar Multipurpose Project has been bilaterally agreed to be set up. The field investigations for Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage-cum-Diversion Project and Feasibility Level Study of Kamala Dam Project and Preliminary study of Bagmati Project in Nepal are in progress."

2.6.3 Regarding inter-basin transfer of water, the Ministry submitted:

"In so far as inter-basin transfer of water is concerned, 14 ILRs in the basin have been identified. Feasibility Reports (Indian portion) of two links have been completed. The Survey & Investigation works (Indian portion) of 7 links have been completed. The field works of remainder, except one link which lies entirely in Nepal, are under progress."

2.7 The Ministry also enlightened the Committee during the evidence that storages are very limited in the Ganga basin due to absence of storage spaces because of the flat terrain. The storages are mostly to be planned in the territory of Nepal. When suggested to build barrages which would serve as storage reservoirs in the river itself, at intervals of about 3-5 kms., the Ministry replied that such barrages would create some inundation in the Gangetic plain which is densely populated.

2.8 Asked further to suggest the best alternative/option to building storage reservoirs in the Gangetic plain areas, the Ministry submitted in a written reply as reproduced below:

"Because of the topographical constraints, building storages in the Gangetic plain areas is not feasible. Given the scenario, water bodies viz. lakes and ponds etc. is considered as an option for storing, to some extent, water available locally mainly during flood season. Over the time, the capacity of such bodies gets reduced depending upon their

catchment characteristics and, therefore, same is required to be restored and maintained.

The Ministry of Water Resources formulated/implemented a pilot scheme "National Project for Repair, Renovation & Restoration (RRR) of Water Bodies directly linked to Agriculture" during Xth Plan. The scheme had been implemented during XIth Plan. The scheme for undertaking RRR works in 10,000 water bodies with a Central Assistance of Rs.6,235 crore has now been approved to be continued during XIIth Plan also. The Scheme includes the comprehensive improvement of water bodies, catchment area treatment, command area development and capacity building of stakeholders, increased availability of drinking water."

(ii) Role of Inter Linking of Rivers programme in reservoir creation

2.9 The Ministry informed the Committee during the evidence recorded on 18 October, 2013 that as a part of the Inter-Linking of Rivers (ILRs) programme, a series of reservoirs have been planned which have to be created in Nepal or in the foothills of the Himalayas. These links would be able to harness the waters of river Ganga and its tributaries before going into the sea. The details of the present status of the implementation of the scheme of ILRs under Himalayan component pertaining to Ganga basin as received from the Ministry are given in table 2.9.

Table 2.9 : PRESENT STATUS OF THE IMPLEMENTATION OF THE SCHEME OF INTER LINKING OF RIVERS UNDER HIMALAYAN COMPONENT

Sl. No	Name of Link	States/Countries concerned	Benefiting States	Status
1.	Kosi-Ghaghra	Bihar, Uttar Pradesh & Nepal	Bihar & Uttar Pradesh	S&I work in progress
2	Gandak-Ganga	-do-	Uttar Pradesh	S&I work completed
3.	Ghaghra-Yamuna	-do-	Uttar Pradesh	FR completed (for Indian portion)
4.	Sarda-Yamuna	Bihar, Uttar Pradesh, Haryana, Rajasthan, Uttarakhand & Nepal	Uttar Pradesh & Uttarakhand	FR completed (for Indian portion)
5.	Yamuna-Rajasthan	Uttar Pradesh, Gujarat, Haryana & Rajasthan	Haryana & Rajasthan	S&I work completed
6.	Rajasthan-Sabarmati	-do-	Rajasthan & Gujarat	S&I work completed

Sl. No	Name of Link	States/Countries concerned	Benefiting States	Status
7.	Chunar-Sone Barrage	Bihar & Uttar Pradesh	Bihar & Uttar Pradesh	S&I work completed
8.	Sone Dam - Southern Tributaries of Ganga	Bihar & Jharkhand	Bihar & Jharkhand	S&I work in progress
9.	Manas-Sankosh-Tista-Ganga (M-S-T-G)	Assam, West Bengal, Bihar & Bhutan	Assam, West Bengal & Bihar	S&I work in progress
10.	Jogighopa-Tista-Farakka link (Alternative to M-S-T-G)	-do-	Assam, West Bengal & Bihar	S&I work in progress
11.	Farakka-Sunderbans	West Bengal	West Bengal	S&I work completed
12.	Ganga(Farakka) -Damodar-Subernarekha	West Bengal, Orissa & Jharkhand	West Bengal, Orissa & Jharkhand	S&I work completed
13.	Subernarekha-Mahanadi	West Bengal & Orissa	West Bengal & Orissa	S&I work completed
14.	Kosi-Mechi	Bihar, West Bengal & Nepal	Bihar	Work could not be initiated as it lies entirely in Nepal

FR : Feasibility Report
S&I : Survey and Investigation

2.10 When asked to state whether any time-frame/schedule has been fixed for completion of the Himalayan component of ILR scheme, the Ministry submitted as under:

"The time-frame/schedule has not been fixed for completion of the ILR programme, as the ILRs are at conceptualisation stage only. The same would be fixed while finalising their Detailed Projects reports (DPRs). However, Union Government is in dialogue with Nepal and Bhutan through bilateral mechanisms for expediting field works for early completion of DPRs of the links involving these countries."

2.11 Asked further to enlighten the Committee about the interim measures taken/proposed to be taken to control floods and arrest wasteful river discharge into the sea (specially for Ganga basin area) before implementation of ILR programme is achieved, the Ministry in a written reply stated as under :

"Since implementation of ILRs and storage projects in the upper catchment to improve water utilisation in the basin and control flood in long run are major works involving huge investments, arrangements such as flood forecasting work and implementation of RRR scheme in the area are relied upon."

(iii) **Flood-affected areas and magnitude of damage**

2.12 The Committee were informed that flood is a recurring feature in the 11 Ganga basin States. Asked to provide updated State-wise details showing sizes of flood-prone area in the Ganga basin, the Ministry informed the Committee in a written reply as under:

"As assessed by the XIIth Plan Working Group, the 'maximum flood-affected area' as a whole in India is 49.815 million hectare (mha), out of which 23.728 mha is in Ganga basin. The updated details are given in the following table (No. 2.12):

Table – 2.12 : State-wise details of flood-affected area in Ganga basin

Sl. No.	Name of State	Flood-affected area (in mha)
1	Bihar	4.986
2	Jharkhand	0.266*
3	Madhya Pradesh	0.377
4	Chhattishgarh	0.089
5	Uttar Pradesh	7.34
6	Uttarakhand	0.002
7	Delhi	0.458
8	Haryana	1.000
9	Rajasthan	3.260
10	Himachal Pradesh	2.870
11	West Bengal	3.080
	Total	23.728

*Note: * Bifurcation is tentative, as per the information available on the website of Government of Jharkhand (<http://jharkhand.gov.in>)*

It is pertinent to mention that, the maximum flood affected area is dynamic in nature and may change over time due to occurrence of unprecedented rainfall, depending upon the prevailing flood conditions in the area or geological upheavals, etc."

2.13 According to the Annual Report (2012-13) of the Ministry of Water Resources (Ganga Flood Control Commission), flood-prone areas in the Ganga basin States is to the tune of 20.40 million ha. As assessed by Rashtriya Barh Ayog (RBA) the total such area is 203.96 lakh ha.,

whereas States reported to XIth Plan Working Group the figure as 242.34 lakh ha. The difference between these two are to the tune of 38.38 lakh ha.

2.14 On being asked about difference in figures regarding flood affected-area of Ganga basin as assessed by RBA and States, the Ministry furnished the written reply as under:

- a) Assessment by RBA was done using the data upto 1978, whereas, the Plan Working Group used more recent data using latest technology.
- b) The data, terminology and methodology used by RBA and the Working Group were different.

2.15 With regard to the information about State-wise flood-affected/prone areas, the Ministry have further informed the Committee as follows:

"As regards bifurcation of flood-affected/ prone areas State-wise, the Ministry of Water Resources has also constituted an Expert Committee for scientific assessment of flood-prone areas in the country which has decided a flood frequency based criteria and it has also decided to set up Regional Committees for compilation and assessment of State-wise flood-prone areas."

2.16 The Committee desired to be apprised regarding the average annual rainfall, total cropped area, flood-prone area and flood-protected area as recorded in 1972 the year of the inception of Ganga Flood Control Board (GFCB) and as on 18.10.2013. To this query, the Ministry replied that the relevant information was being collected. When the Committee further enquired about the proportion of the total flood-prone area falling under cropped area, the Ministry stated that the required information was also being collected.

2.17 On being asked by the Committee about the magnitude of losses caused by recurring flood menace in the 11 Ganga basin States since 2000, the Ministry in a written reply submitted detailed data and information for the period 2000 to 2012, the gist of which are summarized in table 2.17:

Table – 2.17 : Flood damage during 2000 to 2012

Sl. No.	Name of State	Magnitude of damage	
		Population affected (in millions)	Total damage of crops, houses & public utilities (Amount in Rs. crore)
1	Bihar	89.091	8,485.655
2.	Chhattisgarh	2.25	598.902
3.	Haryana	1.755	126.444
4.	Himachal Pradesh	3.698	8,484.681
5.	Jharkhand	0.025	1.144
6.	Madhya Pradesh	4.109	505.767
7.	Rajasthan	0.634	3,007.57
8.	Uttar Pradesh	32.88	6,307.055
9.	Uttarakhand	0.047	--
10.	West Bengal	65.823	9,226.924
11.	NCT of Delhi	--	--
	Total	200.312	36,744.142

2.18 When asked to furnish the factors responsible for recurrent flood problem in the 11 Ganga basin States, the Ministry furnished a written reply as reproduced under:

"The recurrent floods in Ganga basin States are due to high intensity rains falling in short duration, heavy rains of long duration, high flows from upper hilly regions, inadequate river capacities and inadequate maintenance of river embankments, etc."

2.19 The Committee further desired to know whether the endemic flood problem in the Ganga basin area can be effectively controlled, managed or even be permanently eradicated.

To this query, the Ministry submitted in a written reply as under:

"Due to geographical setting of Ganga basin, permanent immunity against floods is not deemed to be practically feasible. However, the impact can be mitigated by having combination of structural measures like large storage dams in upstream reaches, adequate river embankments; non-structural measures like flood inundation forecasting, enactment and implementation of flood plain zoning legislation by States."

(iv) Flooding in Farakka Barrage areas

2.20 The Farakka Barrage is a barrage across the river Ganga, which is about 17 km. from the Bangladesh border near Chapai Nawabganj district. The canal from the Barrage to the Bhagirathi-Hooghly river is about 40 km. long. Most of the time, even recently, excess release of water led to flooding in Lalgola block. It was further stated that due to non-maintenance of the embankment, villages get flooded and huge acres of land get submerged due to release of excess water.

2.21 When asked to state whether there is any concrete plan to resolve the problem of flooding in Farakka barrage areas during XIIth Five Year Plan and the steps taken/proposed to be taken, including the amount allocated and expenditure incurred till date, the Ministry in a written reply informed as under:

"The Farakka Barrage is a diversion structure with a little ponding during lean season, which has hardly any significance in terms of storage during flood season. As such, question of releasing of excess water through the barrage does not arise. Farakka Barrage Project (FBP) maintains downstream left afflux embankment of 16.31 km long, from Jangipur Barrage to Moya in Lalgola Block of Murshidabad district.

Since last 30 years, there has not been any breach in the embankment resulting in flooding/ inundation of villages or land.

The Farakka Barrage would continue to repair and maintain the embankment during XIIth Plan.

Allocation during XII th Plan	: Rs.520.00 lakh
Expenditure during the Plan upto 10/2013	: Rs.135.11 lakh"

(v) Flood Management in Ganga basin States

2.22 According to the National Water Policy 2012, specific guidelines for management of flood and drought have been laid down which are reproduced below:

"While every effort should be made to avert water related disasters like floods and droughts, through structural and non-structural measures, emphasis should be on preparedness for flood/drought with coping mechanisms as an option. Greater emphasis should be placed on rehabilitation of natural drainage system." (Para No. 10.1).

2.23 The river systems of Ganga basin include 23 river systems (including Kosi) most of which are inter-State rivers. Asked whether the flood-prone Kosi river has been tamed to prevent the annual devastating flood fury in north Bihar, the Ministry in a written reply submitted as under:

"Efforts have been made by construction of embankment to provide a reasonable degree of protection to a large extent. Necessary river training works are taken by the Government of Bihar in order to save the embankment from river attack. In order to have long-term flood mitigation in Kosi river, joint field investigations for construction of Sapta Kosi High Dam in Nepal, have been undertaken."

2.24 The Ministry also informed the Committee that the Ganga basin covers a drainage area comprising 86.14 Mha. whereas the flood protected area in the Ganga basin States aggregates only 9.39 Mha. When the Committee enquired about the specific programme initiated by the Government to tackle the perennial flood havoc in areas located outside the 9.39 Mha. flood protected area in Ganga basin, the Ministry submitted as under:

"Flood management being within the purview of States, the related schemes are formulated and implemented by concerned State Governments. The role of Union Government is advisory in nature. In order to supplement the efforts of State Governments, the Union Government has taken following initiatives:

- (a) *Continuation of Flood Management Programme (FMP) during XIIth Plan*– During XIth Plan, FMP had been launched under which 97 works of Ganga basin States were approved out of which 52 have been completed and Central Assistance of Rs.1857.37 crore has been provided as on 31.10.2013. The completed works have restored 10.766 lakh ha of flood-affected area and protected 0.445 lakh ha of new flood-affected area. The Government of India has approved continuation of Flood Management Programme during XIIth Plan in order to enable State Governments (including Ganga basin States) to complete the ongoing works on priority, new works of catchment area treatment and to undertake more works of river management, flood control, anti-erosion, drainage development and anti-sea erosion.
- (b) *Emphasis on Enactment and Implementation of Flood Plain Zoning regulation* – Uttarakhand and Rajasthan have enacted legislations about Flood Plain Zoning and Uttar Pradesh has also initiated actions in this regard. Ministry of Water Resources (MoWR) has been pursuing the matter with remaining Ganga basin

States. Same when implemented, is perceived as an effective tool in reducing flood damages, etc.

Flood forecast with sufficient warning time by Central Water Commission (CWC) has resulted in/is aimed at minimizing loss of life and property."

(vi) Role of global climate change in Ganga basin flood

2.25 The Committee enquired about the extent to which the floods in the Ganga basin are related to global climate change. To this query, the written reply of the Ministry is reproduced as under:

"Indian Network of Climate Change Assessment (INCCA), a network-based scientific programme of Ministry of Environment and Forests (MoEF), conducted studies including impact of climate change on water resources in four regions of the country including Himalayan region. The specific outcomes with respect to Impact of climate change on floods indicate that the flooding could vary from 10 percent to over 30 percent of the existing magnitudes in most of the regions by the year 2030."

2.26 When further asked whether any study has been made regarding linkage between global climate change and the floods in the Ganga basin by the Government/Ganga Flood Control Commission (GFCC), the Ministry submitted as under:

"The Ministry of Water Resources is in the process of taking up the basin level studies for assessing impacts of climate change on water resources. The studies could give more specific outcomes of projections about events in various basins including Ganga basin."

2.27 The representative of the Ministry also apprised the Committee during a briefing meeting held on 20 July, 2012 that the Central Water Commission (CWC) is having a Climate Change Cell which study many other aspects apart from the impact of glacier melt on river flow volume in Himalayan region. The National Institute of Hydrology (NIH) is also engaged in this work. Further, on being asked whether there is any coordination between CWC and NIH in this regard, the Ministry replied as under:

"The CWC has taken up two studies (a) Inventory and monitoring of glacial lakes and water bodies in Himalayas affecting India and (b) Development of Snowmelt-Runoff models with National Remote Sensing Centre (NRSC), Hyderabad. In both the studies there are monitoring committees where NIH is providing necessary inputs."

2.28 The National Water Policy, 2012 states that "planning and management of water resources structures such as dams, flood embankments, tidal embankments, etc., should incorporate coping strategies for possible climate changes. The acceptability criteria in regard to new water resources projects need to be re-worked in view of the likely climate changes." The representatives of the Ministry while deposing before the Committee also informed that it is enjoined in the National Water Policy, 2012 that the impact of climate change should be factored into all projects which would be implemented. Asked about the steps being proposed in this regard, the Ministry stated in a written reply as under:

"The Ministry has constituted a Committee to review the guidelines for preparation of Detailed Project Report (DPR) which, *inter-alia*, would also consider to incorporate factoring of impact of climate change in formulation and implementation of projects."

CHAPTER-III

GANGA FLOOD CONTROL COMMISSION

The Ganga Flood Control Board (GFCB) was set up by the Government of India vide a resolution on 18.04.1972 with the objective to effectively tackle the critical and chronic flood problems of the Ganga basin and to minimize the associated damages by (a) laying down the broad policies and decide priorities in the implementation of various schemes; and (b) issuing necessary directions in respect of formulation of comprehensive plan for flood control in the Ganga basin and approval of schemes. The **Ganga Flood Control Commission** (GFCC), a subordinate office of Ministry of Water Resources, was also created in 1972 to act as the Secretariat and executive limb of Ganga Flood Control Board (GFCB) and to deal with the floods and its management in Ganga basin States. The headquarters of the Ganga Flood Control Commission are at Patna.

(i) Objectives and Functions

3.2 The objectives and functions of GFCC are reproduced as under:

- To prepare a Comprehensive plan of flood control for the Ganga basin. The field investigations and collection of data for the purpose will be carried out by the State Governments as directed by the Ganga Flood Control Board.
- To draw out a phased and coordinated programme of implementation of works included in the basin-wise plans.
- To advise the concerned States to follow certain guidelines in respect of quality control, material specifications and maintenance in order to ensure the implementation of works and the maintenance thereof to proper standards.
- To prepare the annual programme for works and allocation of cost, wherever required for consideration of the Board.

- To evaluate the performance of major flood control measures executed by the States including all the inter-State Flood Control Schemes.
- To make an assessment of the existing ventways (waterways) under the road and rail bridges and to determine additional waterways to be provided for reducing the drainage congestion to reasonable limits.
- To monitor the execution of the important flood control schemes particularly those receiving Central Assistance or being executed under the Central Sector.
- To examine all major and medium flood control, drainage, anti-water-logging and anti-erosion schemes of Ganga basin States except for schemes of the States of Haryana, Uttar Pradesh and Delhi on the river Yamuna in the reach from Tajewala to Okhla Barrage.*
- Documentation and dissemination of findings emerging out of all special studies or investigations conducted in participation with scientific organizations for appropriate use by basin States.

* *The Union Government constituted the Upper Yamuna River Board in 1995 as a subordinate office under the Ministry of Water Resources. 'Upper Yamuna' refers to the reach of Yamuna from its origin at Yamunotri to Okhla Barrage at Delhi. Upper Yamuna Basin States include Himachal Pradesh, Uttar Pradesh, Uttarakhand, Haryana, Rajasthan and Delhi. The functions of the Board include all aspects of water management in the Upper Yamuna Basin.*

3.3.1 When the Committee enquired about the extent to which the objectives and mandate of GFCC have been achieved, the Ministry informed the Committee that the objectives of GFCC have been achieved to a large extent as enumerated below:

- (a) *Comprehensive planning for effective flood management in the Ganga basin* - Detailed Comprehensive Plans for all the 23 individual river systems of the Ganga basin were prepared by the Ganga Flood Control Commission and sent to the State Governments for follow up action. The work of updating these comprehensive plans has been taken up due to changes, additional information/

data on hydro-meteorology and morphology in the basin in the subsequent years. By the year 2004, all 23 comprehensive plans had been updated once. The process of second updating of 5 plans has also been completed.

- (b) *Identification and planning for management of drainage congestion in the Ganga basin* – (The) GFCC has undertaken studies for assessment of adequacy of waterways under the road and rail bridges. This exercise is aimed at determining additional waterways required for reducing drainage congestion to a reasonable limit. The study has been completed for all river systems in Ganga basin except Tidal River System and Ganga Main Stem. For Ganga Main Stem, the study has been completed for the stretch between Haridwar to outfall. These reports have been circulated to the Ganga basin States and concerned Departments of Central and State Governments including Ministry of Railways for follow up action.
- (c) *To prioritise, co-ordinate and monitor the flood management activities in the Ganga basin*
- Ganga Flood Control Commission has been actively associated in formulating the report of the Working Group for Five Year Plans concerning the flood sector. Annual plan proposals of Ganga Basin States are perused in the Ganga Flood Control Commission, whenever received. (The) Ganga Flood Control Commission participates in Annual Plan discussions in Planning Commission.
 - Techno-economic appraisal of flood management schemes of the Ganga Basin States is a continuing activity of GFCC. A large number of such flood management schemes have been examined by GFCC since its inception for implementation by basin States. Presently, on an average, about 35-40 schemes are technically examined every year.
 - The monitoring of implementation of all schemes funded by the Central Government in Ganga Basin is being carried out by GFCC. At present, funding is provided by the Central Government under the Flood Management Programme (FMP) and the Plan Scheme 'River Management Activities and work related to border areas'.
- (d) *To actively engage with Nepal and Bangladesh for effective management of flood and inundation problems in border areas and also other inland areas by creation of storages in their territory.*

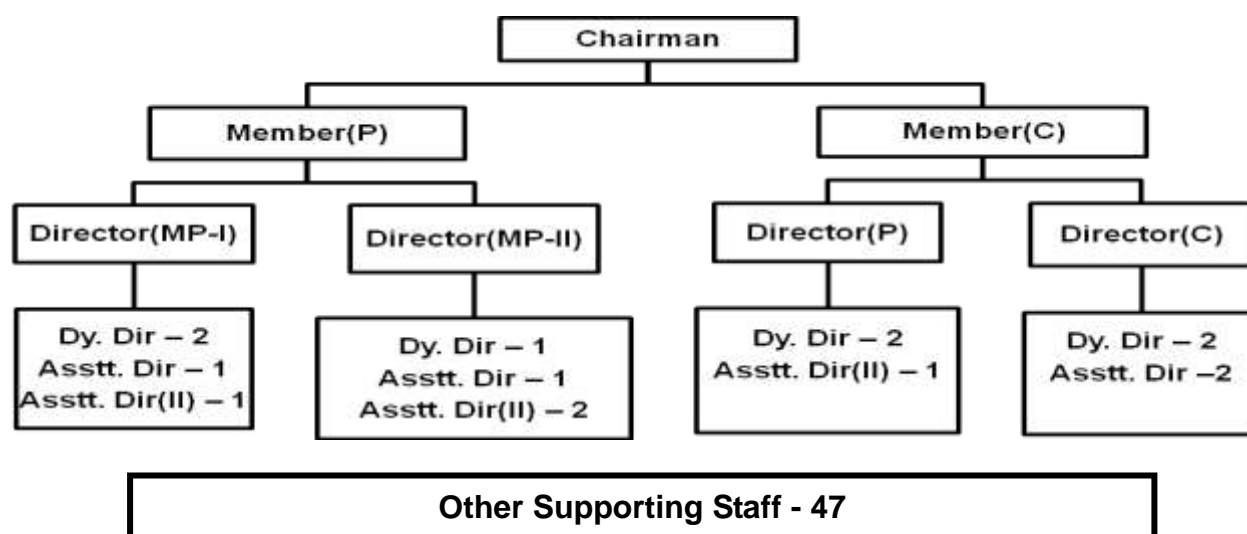
3.3.2 The Ministry further submitted that the Government of India is having continuous dialogue with the Government of Nepal and Bangladesh to mitigate devastation caused by the flood.

3.4 Asked to give suggestions, if any, for improving the effectiveness of the two bodies (GFCB and GFCC) in fulfilling their mandate, the Ministry submitted as under:

"Capacity building programmes for the officers of GFCC would prove to be catalytic in enhancing effectiveness of GFCC."

(ii) Organization and Manpower strength

3.5 The organizational structure of Ganga Flood Control Commission is given in the Chart as under:



3.6 When the Committee asked whether the present structure of GFCC is adequate for the current level of activities and responsibilities and whether there is a need for restructuring the organisation to achieve its objectives and mandate, the Ministry in a written reply stated as under:

"The present sanctioned strength of GFCC appears to be adequate. However, filling up of vacant posts and introduction of appropriate capacity building programmes for officers of GFCC are expected to bring more effectiveness in the working of GFCC and would help in achieving its objectives and entrusted mandate."

3.7 Asked to furnish the manpower/staff strength of Ganga Flood Control Commission as on 1st October, 2013, including categories, sanctioned strength, actual strength and vacancies, the Ministry submitted the information which are reproduced in table 3.7.

Table – 3.7 : Manpower/Staff strength of Ganga Flood Control Commission

Sl. No.	Group	Originally Sanctioned	Status as on 01.10.2013 (After deemed abolition of 32 posts)		
			Total	Filled	Vacant
1	A	23	18	14	4
2	B (Gazetted)	13	4	3	1
3	Other Supporting Staff	65	47	36	11
	Total	101	69	53	16

(In addition, there are 19 posts of work-charged establishment.)

3.8 When further queried as to whether arrangements have been put in place for improving the efficiency and skills of the staff of GFCC, the Ministry in a written reply stated as under:

"The facilities of training provided by NWA (National Water Academy), Pune and ISTM, New Delhi are gainfully utilized for capacity building programmes."

3.9 Asked to state whether adequate avenues have been put in place to motivate the staff working in GFCC through regular promotional avenues, the Ministry replied as under:

"The Officers of GFCC are drawn from Central Water Engineering Services. The promotion of other staff in GFCC cadre is vacancy based and is given on seniority basis."

(iii) Meetings of GFCC

3.10 The Ministry informed that the meetings of GFCC are held regularly for interaction among Ganga basin States. So far, 44 meetings of GFCC have been held. The last meeting of GFCC was held on 12 March, 2013.

3.11 The summary record of the 44th meeting of the Ganga Flood Control Commission held on 12 March, 2013 at New Delhi has been furnished by the Ministry to the Committee. During the deliberations, the Chairman, GFCC expressed deep concern about the poor quality of the

Detailed Project Reports (DPRs) being submitted to GFCC for techno-economic appraisal. In most of the cases, it was seen that the schemes were not being formulated as per the guidelines of GFCC for formulation of flood management schemes. Due to non-submission of the DPRs according to the guidelines and also due to lack of various information/data in the DPRs, the techno-economic appraisal of the schemes takes undesirably long time. Thus the appraisal of the schemes get delayed considerably. Accordingly, the Chairman, GFCC requested the member States to ensure that flood management schemes submitted by various State Governments are strictly as per the guidelines circulated by GFCC. It was also decided that Engineer-in-Chief of the respective State Governments should enclose a certificate while submitting the scheme that the DPR has been prepared as per the GFCC guidelines.

3.12 As per the summary record of the 44th meeting of the GFCC (12 March, 2013), it was pointed out that the quarterly physical and financial progress report of the various schemes being implemented by Ganga basin States with Central Assistance were not forthcoming regularly. As a result, it is causing delay in monitoring of the schemes and release of funds. All concerned member States were requested to nominate a nodal officer who would be responsible for collecting/compiling the information and furnishing the same to GFCC. The representative from Bihar intimated that Executive Engineer, Flood Monitoring Cell will be the nodal officer. Other member States intimated that they would send the nomination of nodal officers at the earliest. It was also further stated that the annual plan proposals in respect of flood management schemes are not being received in GFCC from Ganga basin States. As a result, it becomes difficult to ascertain as to what works are planned by the various States. Similarly, the proposals for XIIth Five Year Plan had also not been received in GFCC. It was, therefore, decided that member States would send Annual Plan document (2012-13) and XIIth Five Year Plan documents (2012-17) to GFCC by 31st March, 2013.

3.13 The Ministry also informed that discussion on all issues such as design, planning, formulation and implementation of flood management schemes was also held during the 44th meeting of GFCC, which included several points, viz. (i) Return Period of Flood for design of embankment in rural areas (ii) Revetment/Pitching on embankment/river bank should be upto Dominant Flood Level (DFL) (iii) Top width of the embankment should be 5 m (iv) Setting up of quality control and monitoring set up (v) Separate Flood Control Division/Unit. It was also stated that as regards design criteria for return period of flood, revetment/pitching and top width of the embankment after detailed discussions it was decided that member States would send a report containing their views with proper justification to GFCC for needful action in the matter. Regarding the quality control and monitoring set up and separate division for flood control, it was decided that the member States would intimate their views to GFCC at the earliest. Further, the member States agreed to send the detailed report on the subject within a month to GFCC so that the matter could be taken up with the concerned agencies for further action. The 45th meeting of GFCC was scheduled for January, 2014 at Kolkata.

(iv) Financial Position

3.14 The Committee wanted an update on financial position of Ganga Flood Control Commission as a whole, to which the Ministry in a written reply submitted as under:

"GFCC is an organization of Ministry of Water Resources; hence no funds are released to GFCC under State Plan or as Central Assistance. The expenditure on establishment and activities of Ganga Flood Control Commission is met, from the Plan Scheme 'River Management Activities and Works Related to Border Areas'. The above Plan Scheme has been appraised by the Expenditure Finance Committee (EFC) in the meeting held on 29.05.2013 and the minutes are awaited. During XIIth Plan, an expenditure of Rs.7.24 crore has been incurred on establishment and continuing routine activities of GFCC."

In a subsequent written communication, the Ministry has informed that it has received the minutes of the meeting of EFC held on 29.05.2013.

3.15 Asked if the funds available with the Commission are sufficient to meet the needs of its programmes/schemes, the Ministry stated as under:

"Yes, Sir. The provision proposed for GFCC in the EFC Memo for the Plan Scheme 'River Management Activities and Works Related to Border Areas' during XIIth Plan, appears to be sufficient to meet the expenditure on establishment and activities of GFCC."

3.16 The Committee wanted to know the total amount of expenditure incurred by GFCC (as on 1.10.2013) (Plan-wise and year-wise). To this query, the Ministry furnished the information which is reproduced in table 3.16.

**Table- 3.16 : Expenditure incurred by Ganga Flood Control Commission
(Plan-wise & year-wise)**

Sl. No.	Period	Expenditure (Amount in Rs. crore)
1	XIth Five Year Plan	
	2007-08	2.62
	2008-09	3.84
	2009-10	4.71
	2010-11	4.53
	2011-12	4.78
	Total	20.48
2	XIIth Five Year Plan	
	2012-13	4.80
	2013-14	2.44*
	Total	7.24*
* as on 1.10.2013		

The EFC approved an amount of Rs. 45 Crore for activities of GFCC during the XIIth Five Year Plan against Rs. 68.80 Crore sought by the Ministry of Water Resources.

CHAPTER-IV

IMPLEMENTATION OF WORKS FOR FLOOD PROTECTION AND MANAGEMENT

(A) Works and Activities

(i) Master Plans

According to the Ministry, the main function of the Ganga Flood Control Commission is to prepare Master Plans for flood protection and flood management. The GFCC has prepared Master Plans for all the 23 rivers which are tributaries of the Ganga.

4.2 The Ministry informed the Committee during evidence that the Ganga Flood Control Commission is only an Advisory Commission, and the execution of all works suggested under the Master Plans has to be carried out by the respective State Governments. The respective State Governments undertake these works which include embankments, drainage schemes, even town protection works etc., through the Plan schemes.

4.3 When asked to give the updated status of the implementation of the 23 Master Plans by the concerned Ganga basin States, the Ministry in a written reply stated as under:

"The information regarding status of implementation of recommendations contained in Comprehensive Plans for flood management in Ganga sub-basins is not forthcoming from the State Governments despite best efforts, including reminding of the same during GFCC/GFCB meetings."

4.4 The Committee wanted to know the follow-up action taken by the Ministry/GFCC for effective implementation of these 23 Master Plans. To this query, the Ministry in a written reply submitted as under:

"The GFCC has been pursuing the matter for preparation of the Action Plan for implementation of recommendations of the Comprehensive Plans. However, the response of the State Governments is not forthcoming. The States have also been reminded for the same in various GFCB/GFCC meetings. Further, in February 2013, the Ministry of Water Resources requested six severely flood-affected Ganga basin States, namely Bihar, Uttar Pradesh, West Bengal, Jharkhand, Himachal Pradesh and Uttarakhand to constitute Implementation Committees headed by concerned Principal Secretary to ensure time- bound Implementation of the recommendations of the

Comprehensive Plan. So far, the Implementation Committees have been constituted by the States of Bihar and West Bengal.”

4.5 When asked whether the Ministry/GFCC has sent notice to the concerned basin State Governments to take up any scheme/works in the light of the Master Plans and what action the concerned State Governments have taken in this regard including obtaining the approval of the Union Government, the Ministry submitted as under:

“The GFCC has circulated the updated Comprehensive Plans to all Ganga basin States requesting them to formulate appropriate projects based on availability of funds and their priority. The State Governments are generally formulating flood management schemes, keeping in view of these Master Plans and also to address the other flood problems faced and priority in the State. The flood management is the responsibility of the concerned State Government. The role played by the Central Government, thus, is advisory in nature.”

(ii) Embankments

4.6 Commenting on the advantages and disadvantages of embankments as a flood protection measure, the Ministry submitted that the National Commission on Integrated Water Resources Development Plan constituted by the Ministry of Water Resources has deliberated on these issues and their findings are reproduced as under.

"Embankments have created drainage congestion in the protected areas and are subjected to erosion by attacks from the river flows. After construction, silt-laden waters do not enter the flood plains and to that extent, the natural silt deposits which have been contributing to fertility of the land are not available after construction of the embankments. Further, the embankments give protection from floods up to the specified frequency of say 1:25 years or 1:100 years. If higher flood come, the embankments are overtopped and they are breached causing serious flood damages. Adding to the problem, building activity takes place behind the embankment in the false hope that the protected area is safe. On the plus side, in spite of the deficiency mentioned above, the demand for providing flood embankment has been on the increase and since the area behind are protected from frequent flooding, they are available for cultivation during Monsoon as well as the Rabi seasons. Embankments also protect built-up area in the towns and cities. However, care has to be taken to ensure that building of embankments in one river reach does not cause damages in the adjoining and lower reaches."

4.7 The Ministry have furnished the following information (Table 4.7) regarding embankments/flood management works in Ganga basin States:

Table – 4.7 : Embankments/Flood Management works in Ganga basin States

Sl. No.	Name of State	Total Area of State (MHa)	Area liable to flood (MHa)	Area protected (MHa)	Length of embankment (km)	Length of Drainage Channel (km)
1.	Bihar	9.42	4.26	2.95	3610	365
2.	Uttar Pradesh	23.86	7.34	1.70	2097	3995
3.	West Bengal	8.88	2.65	2.57	10539	7393
4.	Chhattisgarh	13.52	#	-	-	-
5.	Haryana	4.42	2.35	2.00	1144	4385
6.	Himachal Pradesh	5.57	0.23	0.02	159	11
7.	Jharkhand	7.97	#	-	14	0
8.	Madhya Pradesh	30.80	0.26	0.01	26	-
9.	Rajasthan	34.22	3.26	0.08	145	197
10.	Uttarakhand	5.35	#	-	9	-
11.	NCT Delhi	0.15	0.46	0.07	83	453
	Total	144.16	20.81*	9.40	17826	16799

(1) # The flood prone area in respect of Uttarakhand, Jharkhand and Chhattisgarh are included in the area against Uttar Pradesh, Bihar and Madhya Pradesh respectively.

(2) The above information is provided for the entire State and not just the Ganga basin area.

* The information in this column stands revised, please see Table 2.12

The Ministry also informed that the details of cost involved in the construction of embankments have not been compiled so far.

4.8 The matter regarding the quality or compaction of embankments built on river Bagmati was raised during the meetings of the Committee held on 20 July, 2012 and 18 October, 2013. In this regard, the Ministry informed in a written communication that a team led by Chairman, GFCC and Member (RM), CWC conducted field visit on 27 November, 2013 for an inspection

of the embankment works on river Bagmati in Sitamarhi and Sheohar districts (Bihar). A report regarding the matter titled 'Report of Inspection of the works for construction of embankment on river Bagmati in Sitamarhi and Sheohar Districts of Bihar under Centrally Assisted Flood Management Schemes' was submitted by the team. In the Report, the inspection team made several observations highlighting necessary maintenance works required to be undertaken on the embankments. For instance, the brick soiling on the top of embankments were found to be disturbed at locations inhabited by people which need to be restored before onset of the coming Monsoon. Heavy rain cuts were observed at many locations damaging the embankment to such an extent that made the reach vulnerable to breach. The sections of the embankments at such locations need to be strengthened using good soil with pitching immediately, to safeguard the embankments from breaching. Further, maintenance of the embankment has not been done after its completion in 2008 leading to its deterioration at many locations. At some locations, side slope was observed to be steep as compared to the design section. A lot of bushes and trees have grown on the embankments both on the river side as well as country side. The existence of trees on slope makes the embankment vulnerable to breach due to piping. Moreover, some of the renovated sluices have become redundant due to change in land use in the nearby area. It is also stated that at RD 4.12 km. of the left embankment, the river is reportedly touching the toe of the embankment with the flow being almost at 90° to it, due to the prevailing morphological conditions making this point the most vulnerable to breach during floods. Occurrence of many encroachments on the embankments is another problem that has been observed in the Report.

4.9 The following recommendations have been made in the Report to rectify the problems observed during the inspection

- (i) Regular maintenance of the embankment may be immediately undertaken to maintain its design section which has been eroded at many places as no maintenance has been carried out since its completion *i.e.* 2008;
- (ii) The soil used for construction of embankment at sites wherein heavy rain cuts have been observed may be replaced with good earth and brick pitching provided. The necessary rectification works at such locations may be carried out at the earliest;
- (iii) Trees and bushes may be immediately removed from the slope of the embankment and section restored to design section. It may be ensured that there is no growth of trees and bushes on embankment in future;
- (iv) Village encroachments and settlements may be removed from embankment with the help of District Administration and deformations caused to the embankment rectified at the earliest;
- (v) The planning regarding the location of sluices needs to be reviewed as per the present requirement and site conditions; and
- (vi) Necessary river training works may be immediately taken up at sites where river has come very near to the bank so as to ensure that the river flows in central portion. This is very important to safeguard the embankment from breaching at locations where river is either hugging or hitting the embankment.

4.10 The Ministry informed the Committee that provision has been made in XIIth Plan for re-visiting the entire embankment again, where it is vulnerable, by use of modern type of materials like geobag/tube filled with the riverine material. These materials are said to be environment friendly and having other advantages as well. Further highlighting the benefits of using modern

geo-textile/geo-synthetic materials/geo-bags, etc., on embankment building, the Ministry informed as under:

“The benefits of using modern geo-textile/ geo-synthetic materials/ geo-bags, etc., in construction of embankments are as under:

- Geo-textile materials/membranes have high tensile strength which provide safety to embankments against puncture, breaches and erosion.
- Use of geo-textile materials like geo-nets etc., inside embankments in layers, provides more stability of slopes and the embankments can be designed/constructed with steeper slopes. Thus, there is lesser horizontal spread of the base which saves land required for the embankments.
- In cases of non-availability of suitable soil nearby, the locally available soil can be used in geo-bags for construction of embankments and the cost of transportation of suitable soil from farther places can be saved.
- The construction of embankments using geo-textile materials is comparatively faster particularly during emergencies like breaches.
- Besides, specific geo-textile materials can provide better filtration at the base of embankments as compared to conventional sand filters.”

4.11 When asked whether geo-textile/geo-synthetic materials/geo-bags, etc., are comparable with latest international practices, the Ministry in a written reply stated as under:

“The GFCC has advised States to ensure that the material used in embankment is in line with internationally recognized practices / codes.”

4.12 The Ministry has also stated that the above modern materials have been used in Ganga basin at many places viz. Malda, Nadia, 24 Pargana districts of West Bengal; works undertaken by Farakka Barrage Project on main stem of Ganga and river Swan in Una district of Himachal Pradesh for strengthening of embankments including pitching, apron and filters. In view of their inherent properties, use of geo-synthetics is encouraged to the extent possible.

4.13 When asked about the implementing role of GFCC on the construction of embankments, the Ministry in a written reply stated as under :

"The construction of embankments is being carried out by the respective State Governments. The role of GFCC is restricted to appraisal of schemes costing more than Rs.12.5 crore (as per the latest ceiling decided by the Planning Commission). The physical and financial progresses of such schemes are also monitored by the GFCC in case Central Assistance is provided by the Central Government."

(iii) Barrages

4.14 It was suggested that instead of constructing big dams on the rivers, efforts should be made for construction of barrages so that flood water can be diverted to areas having no rivers or experiencing famine. When asked to comment on the issue, the Ministry in a written reply submitted as under:

"A barrage is aimed at diverting river water into a channel for which water level in the river is required to be raised. The water, depending upon its availability in the river, then is carried through the channel to the places where it is needed, depending upon the topography. In the plains, such raising of water creates a very limited storage called ponding of river, while submerging a large area. During flood season, this storage becomes insignificant while there is hardly any storage available during lean season for utilisation. The utility of such arrangement, however, is limited in flood moderation or tiding over the seasonal variation of water availability in the river. A dam is aimed for impounding of water during flood season for its use at later stage. Therefore, replacing a dam with a barrage is technically 'not-a-feasible proposition'. For optimising use of flood water, we may, sometimes, require constructing a combination of both for storing the flood water and diverting the surplus water to water-deficit river basin(s)."

(B) Execution of schemes/works

4.15 Commenting on the execution of schemes/works of flood control, the Ministry informed the Committee as follows:

"...the Technical Committees suggest to start the work in December or latest in January, when the water level in the river is low. It is because the flood protection works done in the low water level have got more life and better sustainability is ensured. But sometimes, rather most of the times, it gets delayed due to other procedural formalities which the State Governments are to follow."

4.16 When asked to specify the 'procedural formalities' of State Governments which delayed flood protection measures in the Ganga basin States, the Ministry submitted as under:

“The main reasons for procedural delay in flood protection works include non-submission of techno-economically sound proposals and delay in compliance of technical observations of GFCC, non-completion of formalities like timely land acquisition, delay in submission of utilisation certificates for the earlier releases and lack of realistic programme of execution of works suitable for lesser availability of working season.”

4.17 Asked whether the Ministry had taken up the matter with the State Governments to remove these procedural formalities, the Ministry submitted as under:

“The matter is brought to the notice of the State Governments at various occasions like GFCC/GFCB meetings besides monitoring visits. The State Governments have agreed to make the proposals as per the guidelines. GFCC also holds meetings with the concerned officers of State Governments for better understanding and guidance for preparation of proposals/compliance to observations.”

4.18 With respect to the need for taking up flood protection measures by the concerned States before December each year, the Ministry submitted:

“The GFCC has always impressed upon the State Governments to submit the proposals at the earliest so that work could start by the end of December in a year.”

4.19 The Ministry also informed in a written reply that the GFCC had prepared compendium of guidelines/specifications and circulated to all concerned to follow the same during the implementation of the schemes, which is helpful in stabilization of the executed works. The GFCC updated the compendium of guidelines/specifications in January, 2004 and circulated them to the Ganga basin States.

4.20 Asked to state the response of the Ganga basin States to the compendium of guidelines/specifications, the Ministry replied as under:

“No specific response/suggestion has been received from any State Government.”

4.21 The representative of the Ministry deposed before the Committee that the Ministry had no specific information as to what the State Governments were doing regarding implementation of Master Plans in spite of the best efforts put in by GFCC. This was because of the deficiencies in the information flow regime between the Central and State Governments. It was

further submitted that sometimes, the information does not come, and as a result a clear picture of the Master Plans *vis-à-vis* their implementation is lacking. The GFCC does not have the funds, which have to be provided through the Flood Management Programme (FMP) of the State sector scheme of Government of India or through the funds which the State Governments have at their disposal.

4.22 When asked to state the measures taken/being proposed to plug the loop-holes and streamline the system in this regard and the results achieved so far (if any), the Ministry in a written reply stated as under:

“The Ministry of Water Resources requested six severely flood-affected Ganga basin States, namely, Bihar, Uttar Pradesh, West Bengal, Jharkhand, Himachal Pradesh and Uttarakhand to constitute Implementation Committees headed by the Principal Secretary to ensure time-bound implementation of the recommendations of the Comprehensive Plan. So far, the Implementation Committees have been constituted by the States of Bihar and West Bengal.”

4.23 Asked further to suggest an effective mechanism to ensure better coordination between the Ministry of Water Resources/GFCC and the State Governments in implementation of flood management schemes in Ganga basin States, the Ministry in a written reply stated as under:

“The mechanism is already in place in Bihar and West Bengal. The matter is being pursued with the remaining States for constitution of the above Committee.”

(C) Technical examination of Flood Management schemes

4.24 As part of its mandate, a large number of flood management schemes have been technically examined by GFCC for implementation by the basin States. Since XIth Plan, the figures in this regard are 309 schemes received for appraisal, 191 schemes cleared, 69 schemes dropped/rejected, on 32 schemes observations have been sent to the concerned States and 17 schemes under examination in GFCC.

4.25 When asked whether any specific time-frame has been prescribed for technical examination of schemes by the GFCC, the Ministry stated as under:

“According to guidelines of CWC, the total time required for examination and sanction/rejection of a flood management scheme costing between Rs.12.5 crore to Rs. 25.00 crore is 6 months and that for schemes costing more than Rs. 25.00 crore is 9 months. These norms are also followed by GFCC.”

(D) Anti-erosion measures

4.26 The longitudinal bed slopes of the river Ganga and its tributaries are steep in the upper reaches, become flatter in the middle reaches and are almost level in the lower reaches. The upper courses are noted predominantly for deep erosion i.e. bed retrogression. The scoured material is carried downstream by the flow and the middle courses have evidence of both erosion and aggradation. The lower reaches where the bed slope is flatter and velocities are low, accumulation process i.e. sedimentation and accretion of the river bed is predominant. Due to meandering, erosion and sedimentation take place simultaneously. However, the problem here is that good quality of land is getting eroded and some sandy type of land gets out.

4.27 The representative of the Ministry testified before the Committee that after Rishikesh, the Ganga river enters the plains but the silt carrying capacity still remains high in Uttar Pradesh and when it comes to Bihar and West Bengal, the silt gets deposited. So, in Bihar erosion is very high.

4.28 Elaborating on the erosion problem in Uttar Pradesh and Bihar, the Ministry informed that the silt deposition is more when river becomes flatter and the river gets deflected toward bank/embankment due to shoal formation. The Ministry also informed that the Ganga flows through a very populated area in Bihar and hence there are no forests on the Bihar portion.

4.29 Asked whether the Ministry/GFCC has taken up with the State Government of Bihar any suggestion for afforestation of the embankment zones in Bihar, the Ministry replied as under:

“The GFCC had prepared Master Plans for entire Ganga Basin and sent them to concerned States including Bihar. These Master Plans emphasise afforestation of the

embankment zones in all Ganga basin States including Bihar as an effective way of soil conservation and catchment treatment. This may reduce silt load in the river to a large extent. Turfing and plantation to the extent practicable is resorted to better reinforcement of soil on embankments. The matter related to soil conservation in catchment is discussed in GFCB meetings and further pursued by GFCC with concerned States and Ministry of Agriculture."

4.30 Regarding anti-erosion measures taken up, the representatives of the Ministry informed the Committee that, as in case of Brahmaputra basin, the GFCC has suggested to the State Governments anti-erosion measures including coverage of embankments with modern geo-textile and geo-synthetic material so that erosion problem can be minimized.

4.31 In the National Water Policy 2012, the following has been laid down in para 10.3 to prevent land erosion by the river:

"In order to prevent loss of land eroded by the rivers, which causes permanent loss, revetments, spurs, embankments, etc. should be planned, executed, monitored and maintained on the basis of morphological studies. This will become increasingly more important, since climate change is likely to increase the rainfall intensity, and hence, soil erosion."

4.32 During the briefing held on 21.11.2008, the representative of the Ministry informed the Committee that the fury of sedimentation in the rivers is such that the deposition of it affects their banks and the existing embankments erratically at some locations, so a complete eradication of erosion is not possible.

4.33 As regards giving compensation to those farmers who are affected by erosion, the representative of the Ministry stated as follows:

"Whenever there is a flood, the State Government assesses, how much damage has taken place and submits a report to the Home Ministry, and they take an overall view of how much assistance (in the form of relief) can be provided to them."

(E) Task Force on flood management / erosion control

4.34 The Government of India in 2004 constituted a Task Force on Flood Management/Erosion Control particularly to look into the problem of recurring floods in Assam

and neighbouring States as well as Bihar, West Bengal and eastern Uttar Pradesh. The Task Force was headed by the Chairman, Central Water Commission. The report of the Task Force was submitted to the Ministry of Water Resources in December, 2004.

4.35 When asked to give the main highlights of the report of the Task Force, the Ministry submitted as under:

“The broad recommendations of the Task Force 2004 were as under:

- Expanding the role of the Central Government in the flood control sector. The flood control schemes should be funded through a Centrally Sponsored Scheme in the ratio of 90 percent Central and 10 percent State from the present 75:25. The corpus for Centrally Sponsored Scheme also needs to be increased substantially to accommodate all critical flood management and critical anti-erosion works.
- Schemes worth Rs.316.14 crore as immediate measure, to be taken before the coming flood season. Schemes worth Rs.2,030.15 crore were recommended under Short-term-I category to be executed during the remaining two years of the Xth Five Year Plan i.e. during the 2005-06 and 2006-07 and Rs. 2,635.81 crore under Short-term-II category to be completed in XIth Plan.
- The total investment for plan / flood management may be at least 1% of the total Plan outlay.
- Earmarking funds in the State sector as additional Central Assistance for maintenance of embankments.
- Eligibility criteria of schemes for Central funding is proposed to be reduced to Rs. 1.0 crore from the existing limit of Rs. 3.0 crore per scheme.
- Creation of a revolving fund of Rs. 50 crore, which may be available annually to the Ministry of Water Resources to take up emergent flood management schemes. The normal requirement of ‘in principle’ approval of the Planning Commission is recommended to be waived in this particular case. The schemes under this fund could be implemented by the States/Boards after inspection by CWC/Brahmaputra Board. The Task Force has further recommended that to mobilize resources for this revolving fund, a flood cess of say 1 percent to 2 percent could be levied on new infrastructure like roads, buildings, power plants, etc. in the flood-prone States.
- The Central Govt. may consider funding the flood control component of the reservoir projects.
- Under the institutional arrangements, setting up of an Authority in the North East region with all the statutory powers. In the meantime, it recommended (for) strengthening and restructuring of the Brahmaputra Board.

- Establishment of Sikkim and North Bengal River Management Board for planning and integrated implementation of measures for flood management in Sikkim and North Bengal.
- Strengthening of the Ganga Flood Control Commission by addition of a Member (Works) and appropriate field formation for investigation and execution of critical flood management works.
- Extension of jurisdiction of Farakka Barrage Organisation from Rajmahal in the upstream to Jangipur Barrage afflux bund in the downstream.
- Strengthening of Flood Management Organisation of the Central Water Commission by restoring the post of Member (Floods) abolished earlier and redeployment of posts of Chief Engineer, two Directors and other lower level functionaries in order to have policy formulation and coordination amongst various agencies.
- The Brahmaputra Board and the proposed Sikkim and North Bengal River Management Board be entrusted the techno-economical examination of the schemes upto Rs. 15 crore for submission to the Planning Commission for investment clearance.
- Expediting the taking up of reservoir projects in the North East as well as in Nepal and Bhutan under the category of long-term measures for flood management."

4.36 When asked about the status of the implementation of the recommendations of the Task Force 2004, the Ministry replied as under:

- (a) "The Central Government had expanded its role in Flood Sector. During Xth Plan, the Government of India approved the Centrally Sponsored Scheme 'Critical Anti-erosion Works in Ganga basin States' for Rs.305.03 crore and State Sector Scheme 'Critical Flood Control and Anti-erosion Schemes in Brahmaputra and Barak Valley States' for Rs.225.00 crore under which Immediate, Short-Term-I measures as recommended by the Task Force 2004, were undertaken.
- (b) In September 2007, the Government launched 'Flood Management Programme' a State Sector scheme under Central Plan under which an outlay of Rs.8,000 crore for providing Central Assistance to the State Governments for works related to river management, flood control, anti-erosion, drainage development, flood proofing works, restoration of damaged flood management works and anti-erosion works in coastal areas. Under this programme, the Central Assistance of Rs.3,566 crore was provided upto 31.03.2012. In October 2013, the Government has also approved continuation of Flood Management Programme during XIIth Plan with an outlay of Rs.10,000 crore. Besides the type of works funded during XIth Plan, the projects for catchment area treatment having objectives of flood management would also be provided central assistance during XIIth Plan.

- (c) A proposal for setting up of North East Water Resources Authority (NEWRA) was formulated by the Union Ministry of Water Resources. All the States except Arunachal Pradesh welcomed the proposal. The concerns of the State of Arunachal Pradesh are being addressed at appropriate level in Government of India.
- (d) A proposal for setting up of Sikkim and North Bengal River Management Board was formulated by the Union Ministry of Water Resources but the same was not agreed to by the Planning Commission. However, the jurisdiction of Brahmaputra Board had been extended by the Government of India to cover the State of Sikkim and area of north Bengal.
- (e) The Union Ministry of Water Resources had formulated a proposal for setting up of a National Flood Management Commission (NFMC) as an attached office of the Ministry of Water Resources but the same was not recommended by Committee of Secretaries (COS).
- (f) The Government of India, in consultation with the State Government of West Bengal, extended the jurisdiction of Farakka Barrage between 40 km in the upstream and 80 km in the downstream of Farakka Barrage in order to take up the anti-erosion works more effectively on Ganga main stem. Subsequently, anti-erosion works on main tributaries of Ganga on West Bengal were also included in the jurisdiction of Farakka Barrage Project.
- (g) The Government of India is having continuous bilateral discussions through established joint mechanisms with Nepal and Bhutan for expediting construction of large storage reservoir projects in these countries for long-term flood management measures. The field investigations for Pancheshwar Multipurpose Project had already been completed. A Pancheshwar Development Authority (PDA) has been bilaterally agreed to be set up for implementation of the Project. The field investigations for Sapta Kosi High dam Multipurpose Project and Sun Kosi Storage-cum-Diversion Project and Feasibility Level Study of Kamala Dam Project and Preliminary study of Bagmati Project in Nepal are in progress."

(F) Flood Management Programme

4.37 Keeping in view the recommendations of the Task Force and other similar Committees, a Plan scheme titled 'Flood Management Programme' (FMP) amounting to Rs. 8,000 crore was drawn up for implementation under the State Sector during the XIth Plan period. Under this Scheme, a total of 420 nos. of works with an estimated cost of Rs. 9,435.45 crore (with XIth Plan component of Rs.7,739.69 crore), were approved during the XIth Plan. Out of this, 252 number of works were completed and Central Assistance of Rs.3,566 crore was released up to 31.03.2012. In October 2013, the Government of India approved continuation of Flood

Management Programme during XIIth Plan with an outlay of Rs.10,000 crore. Central Assistance would also be provided to the State Governments for selected catchment area treatment projects. The State-wise status of implementation of Flood Management Programme during XIth and XIIth Plan periods is given in table 4.37.

Table 4.37 : STATE-WISE STATUS OF IMPLEMENTATION OF FLOOD MANAGEMENT PROGRAMME DURING XIth AND XIIth PLAN PERIODS

Sl. No.	Name of State	Works approved during XI th Plan (nos.)	Works completed (nos.)	Funds Released (in Rs. crore)		
				XI th Plan	XII th Plan (upto 31.10.2013)	Total Releases (upto 31.10.2013)
1	Arunachal Pradesh	21	11	78.77	0.00	78.77
2	Assam	100	77	744.90	2.51	747.41
3	Bihar	43	26	680.79	54.48	735.27
4	Chattisgarh	3		15.57	0.00	15.57
5	Goa	2	1	9.98	2.00	11.98
6	Gujarat	2		2.00	0.00	2.00
7	Haryana	1		46.91	0.00	46.91
8	Himachal Pradesh	3		165.31	19.92	185.23
9	Jammu & Kashmir	28	8	243.50	39.36	282.86
10	Jharkhand	3		17.07	4.27	21.34
11	Karnataka	3		20.00	0.00	20.00
12	Kerala	4		63.68	0.00	63.68
13	Manipur	22	19	65.03	0.95	65.98
14	Mizoram	2		3.40	0.00	3.40
15	Nagaland	11	9	28.96	15.45	44.41
16	Orissa	67	60	95.64	0.00	95.64
17	Puducherry	1		7.50	0.00	7.50
18	Punjab	5		40.43	0.00	40.43
19	Sikkim	28	21	82.86	0.00	82.86
20	Tamil Nadu	5		59.82	0.00	59.82
21	Tripura	11	4	20.91	0.00	20.91
22	Uttar Pradesh	26	6	290.69	45.66	336.35
23	Uttarakhand	12	3	49.63	24.25	73.88
24	West Bengal	17	7	642.87	54.86	697.73
	Total	420	252	3476.22	263.71	3739.93
Spilled over works of X th Plan				89.79	0.00	89.79
Grand Total				3566.01	263.71	3829.72

4.38 Asked about the numbers of flood control works/schemes approved under FMP during XIIth Plan, the Ministry submitted as under:

“No new scheme has been approved under the Flood Management Programme for XIIth Five Year Plan, so far.”

(G) Expert Committee on flood-prone areas

4.39 According to the representative of the Ministry, an Expert Committee under the Chairman, Central Water Commission was constituted in July, 2012 for scientific assessment of flood-prone areas in the country.

4.40 When asked to state whether the Expert Committee on flood-prone areas (2012) has submitted its report, the Ministry in a written reply stated as under:

“No, Sir. However, during 2nd meeting held on 27 June 2013, the Expert Committee finalised the methodology, classification and criterion to work out the assessment of flood-prone area in the country.”

(H) Working Group on Flood Management

4.41 Testifying on the subject ‘Management of Flood, Erosion and Drought scenario in the Country - Relief, Rehabilitation and Preventive Measures’, the representative of the Ministry submitted that the Government of India has been making assessment of the adequacy of flood management measures through various working groups for specific Five Year Plans. It was further submitted that for XIIth Plan, the Government had set up Working Group on Flood Management and Region Specific Issues which recommended various measures of flood management.

4.42 When the Committee enquired about the recommendations of the Working Group and the status of their implementation, the Ministry merely furnished the details of allocations made under various components of the Flood Management Programme, which are reproduced as under:

“Based on the projection made by States/UTs, an additional area of 6.0 Mha likely to be provided reasonable degree of protection against floods with a proposed outlay of Rs.57,775.00 crore during the XIIth Plan. The details are given as under (Table 4.42):

Table – 4.42 : Allocations under Flood Management Programme for XIIth Plan

Sl. No.	Name of Programme/Scheme	Outlay (Amount in Rs. crore)
A	Central Plan (CP)	
I	Central Sector (CS)	
(i)	River Management activities and Works Related to Border Areas and UTs	1,250.00
(ii)	Flood Forecasting	425.00
(iii)	Infrastructure Development-Land & Buildings of	200.00
(iv)	Farakka Barrage Project (Transport Services)	800.00
	Sub-total (CS)	2,675.00
II	State Sector (SS)	
(i)	Flood Management Programme	16,000.00
	Sub-total (SS)	16,000.00
	Total (CP)	18,675.00
B	State Plan (SP)	39,100.00
	Grand Total (CP+SP)	57,775.00

As recommended by the XIIth Plan Working Group on Flood Management and region specific issues, the Cabinet has, in October, 2013 approved continuation of Flood Management Program during XIIth Plan for providing Central Assistance to the extent of Rs.10,000 crore for works related to flood management, anti-sea erosion and catchment area treatment.”

(I) National Water Policy, 2012

4.43 The National Water Policy, 2012 emphasizes integrated flood management approach and a paradigm shift for adopting an optimum combination of structural as well as non-structural measures.

4.44 The Committee wanted to know whether the Ministry has proposed/formulated any coordinated action plan for flood control in the light of the National Water Policy, 2012 and how the Ministry has approached the issue of managing floods specially in Uttar Pradesh and Bihar which faced heavy rainfall and floods during the year 2013. To this query, the Ministry in a written reply stated as under:

“The Ministry of Water Resources has brought into mainstream the need of integrated flood management by way of having optimum combination of structural and non-structural measures. In this regard, Ministry of Water Resources has, during XIIth Plan, proposed modernisation and expansion of its flood forecasting network to include additional reservoirs under inflow forecasting network, preparation of Digital Elevation Maps (DEMs) in Uttar Pradesh, Bihar and West Bengal, continued persuasion about implementation of Flood Plain Zoning Bill as non-structural measures. The Cabinet has, in October, 2013, approved continuation of Flood Management Programme during XIIth Plan which envisages various structural measures other than storage reservoirs.”

4.45 The National Water Policy, 2012 lays down some procedures for management of floods, including flood forecasting and monitoring which are reproduced below:

“Flood forecasting is very important for flood preparedness and should be expanded extensively across the country and modernized using real time data acquisition system and linked to forecasting models. Efforts should be towards developing physical models for various basin sections, which should be linked to each other and to medium range weather forecasts to enhance lead time. (Para No. 10.4)

Operating procedures for reservoirs should be evolved and implemented in such a manner to have flood cushion and to reduce trapping of sediment during flood season. These procedures should be based on sound decision support system. (Para No. 10.5)

Protecting all areas prone to floods and droughts may not be practicable; hence, methods for coping with floods and droughts have to be encouraged. Frequency based flood inundation maps should be prepared to evolve coping strategies, including preparedness to supply safe water during and immediately after flood events. Communities need to be involved in preparing an action plan for dealing with the flood/drought situations. (Para No. 10.6)

To increase preparedness for sudden and unexpected flood related disasters, dam/embankment break studies, as also preparation and periodic updating of emergency action plans / disaster management plans should be evolved after involving affected communities. In hilly reaches, glacial lake outburst flood and landslide dam

break flood studies with periodic monitoring along with instrumentation, etc., should be carried out.” (Para No. 10.7)

4.46 According to the Ministry, the flood situation in the country including the Ganga basin States is monitored by the CWC every Monsoon. Based on the information provided by CWC, the GFCC also prepares weekly summary of flood situation in the Ganga basin States. Further, based on the flood information received from CWC and GFCC, the various agencies like National Disaster Management Authority (NDMA), MHA, Ministry of Defence and the officials of State Governments are apprised of the flood situation and trend of rivers during emergency meetings of high-level inter-ministerial forums like National Executive Committee headed by the Union Home Secretary.

(J) Flood Havoc in Uttarakhand

4.47 During June, 2013, cloud bursts, floods and landslides brought on by incessant rain led to widespread destruction in North India taking the lives of a large number of people. The worst hit was the State of Uttarakhand, where maximum number of people were reported to have died from floods which also washed away substantial parts of roads, telephone towers, vehicles and houses and left about thousands of pilgrims stranded in Badrinath, Kedarnath, Yamunotri and Gangotri.

4.48 When the Committee asked whether any forecast about heavy rain in the area had been given by the India Meteorological Department (IMD), the Ministry submitted as under:

“It is learnt that India Meteorological Department (IMD) had issued forecast for heavy rainfall in Uttarakhand during 14th to 18th June, 2013.”

4.49 Asked further about the possible reasons for the great flood calamity in Uttarakhand, the Ministry further stated as under:

“The main reasons for high discharges leading to unprecedented flooding and damages in the snow-fed rivers of Uttarakhand can be attributed to combination of one or more factors indicated below:

- (a) Melting rate of glacier being high during the period.
- (b) Unprecedented early, prolonged and heavy to very heavy rainfall in the catchment.
- (c) Occurrence of snowfall prior to rainfall which melted rapidly due to rainfall."

4.50 When asked whether the Ministry has undertaken any study in coordination with concerned scientific organizations such as Indian Space Research Organisation (ISRO) for gathering advance information regarding occurrence of such natural catastrophe, the Ministry submitted as under:

"At present, the CWC is issuing flood forecast at two stations in Uttarakhand *viz.* Rishikesh and Haridwar using conventional methods. CWC has signed Memorandum of Understanding (MoU) with National Remote Sensing Centre (NRSC), Hyderabad for periodic monitoring of glacial lakes & water bodies in Himalayas. Inventory of glacial lakes & water bodies draining in India (>10 ha) has been prepared. Water bodies > 50 ha are monitored on monthly basis during Monsoon. Based on high resolution data, any abnormal increase in size of water bodies is monitored and Glacial Lake Outburst Flood Studies are conducted in coordination with the States. However, the present form of periodical monitoring of glacial lakes and water bodies does not help in fast changing weather triggered natural catastrophe such as cloud bursts."

4.51 Asked whether the advance information was passed on to the State Government of Uttarakhand and the concerned agencies in time, the Ministry stated as under:

"The CWC had issued timely water level forecasts to the local administration for the stations located at Rishikesh and Haridwar. Besides, CWC also shared with the State Government the water-level data of 11 other stations in the State."

4.52 When the Committee wanted to know the magnitude of the destruction caused by the flood in Uttarakhand in 2013, the Ministry submitted as under:

"As per information available on the website of Disaster Management Division, Ministry of Home Affairs, which is the nodal Ministry, the tentative details of damages are as under (Table 4.52):

Table – 4.52 : Magnitude of damages caused by flood havoc in Uttarakhand (2013)

Population affected	1,08,653
No. of human lives lost	580
No. of districts affected	13
No. of villages affected	1,603
No. of cattle/Live- stock lost	9,470
Cropped area affected (in ha)	Not reported
No. of houses Fully damaged	4,726
No. of houses partially damaged	Not reported

The Ministry also stated that the MoWR has set up a Committee under Chairman, GFCC to find the causes for severe destruction in Uttarakhand due to flood and erosion during 16-17 June, 2013. The committee has submitted its report."

(K) Flood Forecasting

4.53 During examination of the Demands for Grants (2013-14), the Ministry stated that there is accuracy of more than 96 percent in flood forecasting by CWC, which is comparable with the best international practices. The Central Water Commission (CWC) issues flood forecasts at 87 stations in Ganga basin States of Uttarakhand (3), Uttar Pradesh (35), Bihar (32), Jharkhand (5), Madhya Pradesh (1), Haryana (1), NCT Delhi (2) and West Bengal (8) during Monsoon period every year. The forecasts are disseminated to various user agencies namely State Revenue/Civil authorities, Water Resources/Irrigation/Flood Control/Disaster Management authorities of respective State Governments, Road and Rail traffic authorities. The water level forecasts issued by CWC are utilised by the State Governments in deciding programmes for evacuation of people from likely flood-affected areas to safer places. These are also used for regulation of rail and road transport in case of submergence of rail/road bridges, etc. The inflow forecasts issued by CWC are used by project authorities in optimum regulation of reservoirs in order to minimise flooding due to sudden release and ensuring water storage for subsequent

use during non-Monsoon. This also helps in advance deployment of National Disaster Response Force (NDRF) teams in affected areas for effective rescue and relief operations.

4.54 When asked about the available mechanism for effective coordination among various Departments to take necessary preventive or preemptive measures based on the flood forecasting, the Ministry submitted as under:

"The CWC maintains close liaison with State Government authorities in effective communication of flood/ inflow forecast to concerned user agencies. In case of severe weather, CWC divisional offices closely liaise with IMD in obtaining weather forecast at frequent intervals. The officers from CWC also attend coordination meetings with all stakeholders before and after Monsoon to make them aware about the flood forecasting activities. The officers of CWC (HQ) also maintain close liaison with National Disaster Management Authority (NDMA) and Emergency Operation Centre of Ministry of Home Affairs in disseminating the warnings to the organisations which are responsible for relief and rehabilitation measures."

(L) National Disaster Management Authority

4.55 The Ministry submitted that in order to mitigate the effects of the natural calamities, a National Disaster Management Authority (the NDMA) has been constituted at the national level by the Government of India. As per allocation of business, the subject matter regarding corpus, utilization of funds and norms related to National Disaster Response Fund (NDRF) are dealt by the Ministry of Home Affairs. The NDMA coordinates policy matters related to disaster management. It has also issued guidelines for management of floods and landslides, which are in public domain also.

4.56 Asked to state the nature of coordination achieved between India Meteorological Department, Central Water Commission, NDMA and the concerned State Governments in the Ganga basin States, the Ministry submitted as under:

"The IMD provides Quantitative Precipitation Forecast (QPF) which is kept in mind in formulation of flood forecasts and their dissemination to concerned authorities including local administration and NDMA by CWC. An MoU had been signed in April, 2011 between IMD and CWC for exchange of real-time meteorological and rainfall

data. The preparedness for Monsoon activities is jointly reviewed by NDMA, CWC, IMD, MHA, etc. prior to every Monsoon."

4.57 Regarding steps for improving the existing mechanism for management of floods, droughts etc. the Ministry also submitted as under:

"The NDMA had issued guidelines for management of floods, which envisaged various strategies for effectiveness of flood management. The suggested strategies include preparation of State level plans and emphasize the need for technological upgradation and capacity building."

(M) Flood Plain Zoning

4.58 Flood Plain Zoning measures aim at demarcating zones or areas likely to be affected by floods of different magnitudes or frequencies of probability levels and specify the types of permissible development in these zones so that whenever the floods actually occur, the damage can be minimized.

4.59 The Committee noted in their 8th Report on the Demands for Grants (2011-12) that a Model Draft Bill for Flood Plain Zoning Legislation was circulated by the Union Government to all the States in 1975 for implementation of Flood Plain Zoning approach. The Ministry apprised the Committee that the States of Manipur, Rajasthan and Uttarakhand have enacted legislations about Flood Plain Zoning. The State of Uttar Pradesh has initiated some action in this regard. The Ministry of Water Resources had requested all the States to send their views about effective implementation of Flood Plain Zoning Bill. The State of Bihar expressed inability to implement Flood Plain Zoning Bill stating that their flood-affected area was quite large. The response from other States was awaited.

4.60 The Committee wanted to know the status of Flood Plain Zoning related measures in the Ganga basin States. To this query, the Ministry furnished the information regarding the implementation of Flood Plain Zoning Bill which are reproduced in table 4.60.

Table – 4.60 : Status of implementation of Flood Plain Zoning Bill in Ganga basin States

Sl. No.	Name of State	Status / views of State
1	Rajasthan	Bill enacted
2	Uttarakhand	Bill enacted. Actions are being taken by the State for its implementation
3	Uttar Pradesh	Enactment kept in abeyance. However, State is taking administrative measures to ensure flood plain zoning.
4	Himachal Pradesh	Bill is under consideration.
5	NCT Delhi	State has informed that provision of Delhi Development Act is sufficient to achieve the objective.
6	Bihar	State informed that enactment of bill could not be considered in view of large flood-affected area.
7	Haryana	Not enacted. The State has informed that necessary administrative measures are taken to ensure flood plain zoning.
8	Jharkhand	State informed that the requirement of bill in Jharkhand is not felt.
9	Madhya Pradesh	State informed that the requirement of bill in MP is not felt.
10	West Bengal	Under consideration by West Bengal Flood Control Board.
11	Chhattisgarh	Views awaited.

The Ministry further stated that the GFCC is pursuing the matter with State Governments by reminding them in this regard during meetings of GFCC/GFCB.

4.61 The Ministry apprised the Committee that at the 16th meeting of GFCB held on 16.01.2013, the Hon'ble Union Minister of Water Resources and Chairman, GFCB observed that the present Draft Bill for Flood Plain Zoning was quite old and would need revision before it

is sent to State Governments for enactment. He asked the GFCB Members to send suggestions in this regard so that the same could be considered while revising the Draft Bill. The Board had requested member States to give their views within a month or so, otherwise the Ministry of Water Resources would revise the present Draft Bill on the basis of past experiences and would circulate the revised draft to all member States for enactment. At the 44th meeting of GFCC held on 12 March, 2013 at New Delhi, it was decided that the member States would send their views in this regard to GFCC at the earliest.

4.62 The Ministry also informed that it has proposed to get Digital Elevation Maps (DEMs) for the flood-affected areas of Uttar Pradesh, Bihar and West Bengal in the XIIth Plan. The DEMs may be used to demarcate various flood zones. However, complete implementation of Flood Plain Zoning Bill will depend on the States.

CHAPTER-V

MONITORING, EVALUATION AND APPRAISAL OF SCHEMES AND UTILISATION CERTIFICATES

(A) Monitoring, Evaluation and Appraisal of schemes

The Ganga Flood Control Commission monitors all Flood Management Schemes in the Ganga basin. The officers of GFCC go and visit the sites and send the report to the Ministry. The GFCC also advises the State Governments. The physical and financial progress of projects is monitored on the basis of information submitted by the State Government in the prescribed formats. Every ongoing scheme is visited at least once in a year.

5.2 When asked to state the experiences gained or the outcome achieved in respect of monitoring works carried out by Ministry/GFCC, the Ministry submitted as under:

"Monitoring by GFCC has helped State Governments in effective execution of projects and ensuring prescribed quality standards of works. The experience gained by GFCC is also utilised in future projects. Thus, monitoring visits are quite beneficial."

5.3 In regard to physical progress of Flood Management Programme (FMP) schemes, the Ministry informed that out of 97 Schemes taken up in the Ganga basin, 52 schemes had been completed as on 01.10.2013, 04 schemes were dropped/withdrawn and 41 schemes were still under progress since 2007-08.

5.4 Asked about the reasons for poor performance of FMP in Ganga basin, the Ministry in a written reply stated as under:

"The availability of limited working season and, in some cases, the disputes related to land acquisition result in delays in execution of projects. Besides, non-submission of Utilisation Certificates (UCs) in time also affects further release of Central Assistance."

5.5 The Committee enquired whether the Ministry has undertaken any study/evaluation on the performance of its Programme. To this query, the Ministry submitted as under:

"The performance evaluation of schemes operated by Ministry of Water Resources during Xth Plan for funding of flood/erosion control projects had been got done through Indian Institute of Public Administration (IIPA) and their recommendations have been appropriately included in Flood Management Programme during XIIth Plan. The action for performance evaluation study for Flood Management Programme implemented during XIth Plan, has been initiated by the Ministry of Water Resources."

5.6 When asked to comment on the efficacy of flood control plans in view of the recurrent floods and the devastation caused, the Ministry stated that the devastation caused has been minimized due to implementation of flood management works which might have been manifold including loss of life which cannot be evaluated in monetary terms.

5.7 Enquired about the degree of effectiveness of measures taken by the Government/GFCC for prevention of land erosion in Ganga basin States, the Ministry replied as under:

"Specific study to quantify the effectiveness of flood management measures in land erosion has not been carried out. However, such measures have been qualitatively effective to a large extent."

5.8 The Ministry also stated that anti-erosion measures undertaken by the States in conjunction with other measures like plantation, channelization and catchment treatment have helped in controlling siltation of the rivers to a great extent.

(B) Utilisation Certificates

5.9 The Ministry informed the Committee during its deposition that during 2007-2008 a sum of Rs.88.00 crore had been released, but no amount was released to Uttarakhand and Uttar Pradesh due to non-submission of Utilization Certificates (UCs). The Committee then sought the updated position regarding submission of Utilisation Certificates by Uttarakhand, Uttar Pradesh, Bihar and West Bengal in regard to utilization of Central Assistance received by these States for flood management schemes/works. To this query, the Ministry in a written reply submitted as under:

"The updated overall position of submission of Utilisation Certificates (UCs) about Central Assistance released to these States for schemes/works under FMP in Ganga basin is as under (Table 5.9):

Table – 5.9 : Position regarding submission of Utilisation Certificates (UCs) for schemes/works under FMP in Ganga basin

Sl. No.	Name of State	Amount Released	UCs Submitted	Balance (Amount in Rs. crore)
1	Uttarakhand	49.62	45.06	4.56
2	Uttar Pradesh	254.42	254.42	Nil
3	Bihar	680.79	664.18	16.61
4	West Bengal	629.47	316.10	313.37

5.10 When the Committee asked whether a comparative study has been made regarding utilization of funds before and after the implementation of the FMP schemes/works, the Ministry informed that they were getting the evaluation done through an independent agency. However, when queried about the status of monitoring/evaluation of FMP schemes/works by independent agencies/authorities since the inception of this system of evaluation and also the criteria for selection of the independent agency and terms and conditions on which their services are utilised, the Ministry made the following written submission:

"The concurrent evaluation of schemes/works funded under FMP is got done by concerned State Governments through independent agencies during execution of such projects. The terms and conditions of evaluation are fixed by the States depending upon the nature of flood management measures proposed."

CHAPTER-VI

COOPERATION WITH NEIGHBOURING COUNTRIES

(A) India-Nepal Cooperation

Several rivers like the Gandak, the Bagmati, the Kamla, the Kosi, etc. originate in Nepal and flow through the hilly tracts of Nepal before entering the plains of India. Heavy rains in the upper reaches not only bring floods of large magnitude but also carry huge quantities of sediment to the plain reaches of India. Hence, any measures to be taken up to alleviate the flood and silting problem are to be done in an integrated manner with proper coordination between the two countries, namely India and Nepal. The Ministry stated that the GFCC is playing a vital role in this regard by providing all the technical know-how and guidance.

6.2 When asked about the measures taken by the Government in agreement with the Government of Nepal to contain the flood havoc in Uttar Pradesh and Bihar, and effectiveness thereof, the Ministry submitted that the following measures are being taken by the Government of India in agreement with Government of Nepal:

- “(a) Transmission of hydro-meteorological data of sites located in Nepal to India during monsoon is done regularly for use in flood forecasting on Indian side in Uttar Pradesh and Bihar. A Task Force has reviewed these arrangements and identified key stations in Nepal, requirement of modern equipment in order to have more effectiveness in data collection and transmission for flood forecasting on Indian side.
- (b) Pancheshwar Multipurpose Project on Indo-Nepal border, Sapta Kosi High Dam, Storage-cum-Diversion Project in Sun Kosi and a dam coupled with a barrage project in Kamla basin in Nepal territory are proposed to be constructed for which studies and bilateral discussions are being held regularly between India and Nepal.”

6.3 When asked about specific role played by GFCC in providing the technical know-how and guidance in this regard, the Ministry in a written reply stated as under:

"The GFCC provides technical assistance, undertakes appraisal and monitoring, and gives recommendation for release of funds of flood protection schemes for execution by the Ganga basin States. The GFCC is also represented in various Committees on Indo-Nepal Cooperation."

6.4 Asked about the reasons why floods are still wreaking havoc in Ganga basin States year after year despite the efforts of Government/GFCC to contain them, the Ministry in a written reply submitted as under:

"The recurrent floods in Ganga basin States are due to high intensity rains falling in short duration, high flows from upper hilly regions, inadequate channel capacities, poor maintenance of river embankments, etc. The situation is likely to improve after implementation of storage reservoirs in Nepal on rivers flowing to India."

6.5 The Ministry also informed that the Joint Standing Technical Committee (JSTC) was constituted during the 3rd meeting of India-Nepal Joint Committee on Water Resources (JCWR) held from 29.09.2008 to 01.10.2008 at Kathmandu. The function of JSTC is to coordinate the work of existing committees and sub-committees under JCWR. Four meetings of JSTC have been held so far.

6.6 The Ministry also informed that a Joint Committee on Inundation and Flood Management (JCIFM) was constituted in the 4th meeting of JCWR held on 12-13 March, 2009 in New Delhi. It was decided that the JCIFM shall be an umbrella Committee to implement the decisions of JSTC in inundation and flood management issues, and shall address issues related to flood management and inundation and can form task group(s), if required. The JCIFM shall also monitor the progress of works and provide guidance to task group(s) and report to JSTC.

6.7 When asked about the number of meetings of JCIFM held so far, and with what outcome and also to what extent the decisions of JCIFM have been implemented so far, the Ministry submitted as under:

"Seven meetings of JCIFM have been held so far. The last meeting was held during 19-24 March, 2013 in Nepal. The JCIFM has been discussing issues related to flood and inundation problem along Indo-Nepal border and takes decisions for measures to be taken by the State Governments of Bihar, Uttar Pradesh and West Bengal and Government of Nepal in their respective jurisdiction. The JCIFM also monitors physical and financial progress of works funded by the Government of India in Nepal on various rivers flowing down to India. The works for construction of embankment in Nepal on rivers Kamla, Bagmati and Lalbakeya are under progress. The issues related to flood forecasting in the region are also discussed in JCIFM."

The Ministry has subsequently informed that the 8th meeting of JCIFM was held from 4-8 February, 2014 in Nepal.

(B) Indo-Bangladesh Cooperation

6.8 The Indo-Bangladesh Joint Rivers Commission (JRC) was set up in November, 1972 to discuss and sort out the issues related to common/border rivers between India and Bangladesh. The set-up provides a platform for resolution of common problems related to development works on common/border rivers, causing no harm to either side.

6.9 When asked to specify the 'common problems' related to development works on common/border rivers that are shared by India and Bangladesh, the Ministry stated that the river bank erosion is the common problem related to development works on common/ border rivers shared by India and Bangladesh.

6.10 The Ministry also stated that 37 meetings of JRC have been held so far since its establishment in 1972. The broad outcome of these meetings are Ganga Water Sharing Treaty, 1996 with Bangladesh for 30 years, implementation of anti-erosion works on common/border rivers and transmission of flood forecasting data of some of the sites of Ganga-Brahmaputra–Meghna basin to Bangladesh during Monsoon period to combat with the fury of floods in Bangladesh.

6.11 When asked about a few 'common problems' between India and Bangladesh that have not been resolved satisfactorily till date and also steps which have been taken/proposed to be taken to resolve these unresolved 'common problems', the Ministry replied as under:

"The common problem between India and Bangladesh that has not been resolved satisfactorily till date is mainly sharing of waters of other common rivers, namely Teesta, Feni, etc. as sharing of water is very complex issue which needs satisfaction of all the parties involved and protection of interest of all stake-holders. Government of India endeavours to arrive at an acceptable formula for sharing of waters which satisfies all the parties and protects the interest of all the stake-holders."

(C) River Management Activities and Works Related to Border Areas

6.12. During XIth Plan period, the Ministry of Water Resources undertook a Plan scheme titled 'River Management Activities and Works related to Border Areas' for water resources development and flood management activities. The Scheme includes provision for taking up maintenance of flood protection works of Kosi and Gandak projects and bank protection works on common/border rivers between India and Bangladesh. Budget allocation for this head during the year 2013-14 was Rs.125.00 crore.

6.13 When asked to give updated position on the achievements made under the scheme 'River Management Activities and Works related to Border Areas', the Ministry submitted in a written reply as under:

"The achievements under the above Scheme are given below:

- (a) Meetings of existing bilateral mechanisms between India and Nepal, Bhutan, China and Bangladesh were held and dialogues on outstanding bilateral issues were furthered.
- (b) The observation of hydro-meteorological data in respect of Pancheshwar Multipurpose Project, joint hydrological observations on river Ganga with Bangladesh, maintenance of hydro-meteorological network in Bhutan for flood forecasting in India, were continued.
- (c) Dialogues were held with Nepal on setting up of Pancheshwar Development Authority (PDA) for finalization of Joint DPR of Pancheshwar Multipurpose Project. Terms of Reference (ToR) of the PDA are being finalised in the Ministry in consultation with various Ministries including Ministry of External Affairs (MEA)

and Ministry of Finance (MoF). The joint field investigations for preparation of DPR of Sapta Kosi High Dam, Storage-cum-Diversion Project in Sun Kosi and a dam coupled with a barrage project in Kamla basin in Nepal territory are being carried out by a Joint Project Office- Sapta Kosi Sun Kosi Investigation (JPO-SKSKI).

- (d) The arrangements for receipt of hydrological data of stations located in Nepal and China were continued. Besides, maintenance of flood protection works of Kosi and Gandak were continued. Three bank protection works on river Mahananda and dredging of river Ichhamati have been completed. About 50 percent of bank protection works on rivers Attrai, Punarbhaba, Tangon, Nagar etc in West Bengal and 50 percent of works on river Feni in Tripura along international border with Bangladesh have been completed.
- (e) Out of the approved outlay of Rs.820.00 crore for XIth Plan, an expenditure of Rs.721.14 core was incurred upto 31.3.2012."

6.14 When asked about the extent of utilisation of amount of Rs.125.00 crore allocated for 2013-14 for this scheme, the Ministry replied that an expenditure of Rs.12.42 crore has been incurred under the above Plan scheme up to 01.10.2013. When further asked whether the budget allocation of Rs. 125.00 crore (2013-14) will be adequate for the Scheme, the Ministry replied in the affirmative.

6.15 The Kosi High Level Committee (KHLC) was constituted by the then Irrigation Department, Government of Bihar in 1978 under the Chairmanship of Chairman, GFCC to review/examine the protection works already executed on the river and recommend protection measures to be taken before the next flood season. Since then, the Committee is inspecting every year the protection works taken up on the river and is making recommendations regarding protection works to be executed on the river before the next flood season. The State Government executes the schemes on the basis of the recommendations of the Committee.

6.16 The Committee wanted to know the details of the year-wise recommendations given by KHLC since the beginning of XIth Five Year Plan, and the extent of their implementation by the Government of Bihar. In reply to this query, the Ministry stated that the KHLC mostly recommends restoration/maintenance of damaged portion of embankments which *inter-alia*

include repair of spurs, de-silting of diversion channels, relaying of River Bed Material (RBM) along with bituminous top. Such works are recommended for both Indian and Nepalese portions of Eastern and Western Kosi Embankments and Afflux Bunds. Recently, KHLC jurisdiction has been extended for an additional reach of 15 km upstream of existing Eastern Afflux Bund in Nepal. The Nepal portion of work is carried out by the Government of Bihar in full as per KHLC recommendations. The work in Indian portion has been carried out by the Government of Bihar as per their own priority and availability of funds. The Ministry did not mention the year-wise recommendations given by KHLC.

6.17 As regards the year-wise reimbursement made by the Government of India in respect of works recommended by KHLC, the Ministry furnished the information as reproduced in table 6.17:

Table – 6.17 : Year-wise reimbursement made by the Government of India in respect of works recommended by KHLC

Year	Reimbursement (Amount in Rs. crore)
2007-08	0.41
2008-09	Nil
2009-10	15.40
2010-11	20.87
2011-12	Nil
2012-13	9.24
2013-14 (So far)	Nil

6.18 Asked about the monitoring of the works of KHLC by the Government/GFCC, the Ministry submitted:

"The expenditure incurred on restoration/maintenance works in Nepal portion by Government of Bihar is reimbursed by Government of India. As these works are basically for restoration/maintenance of completed projects and as such differ from

other schemes receiving Central Assistance, these were not monitored earlier. Monitoring of these works had been done by GFCC for the last two years. The works in Indian portion, if funded under the schemes of Ministry of Water Resources, are monitored by GFCC."

6.19 A breach in the Eastern Afflux Bund at 12 kms. at Kusaha, Nepal occurred on 18.08.2008 in Kosi Barrage. The Ministry claimed that the GFCC took a lead role in providing technical assistance in the Kosi breach closure works that were carried out in the Eastern Afflux bund of Kosi Barrage as well as monitoring of execution of works. The Ministry have informed that no further breaches have occurred in the Kosi Barrage since 2008.

6.20 The Committee wanted to know the total funds provided and utilized in works related to Kosi breach closure. To this query, the Ministry in a written reply furnished the information as reproduced in table 6.20:

Table – 6.20 : Year-wise reimbursement made by Government of India in respect of works for Kosi breach closure.

Year	Reimbursement (Amount in Rs. crore)
2008-09	69.90
2009-10	37.65
2010-11	7.45

6.21 On the long-term or short-term measures taken/proposed to be taken to avoid recurrence of breaches in Kosi Barrage, the Ministry submitted as under:

"As short-term measure, the KHLC inspects the existing works on Kosi river every year and suggests necessary restoration works for implementation by the Government of Bihar. For long-term measure, a High Dam Multipurpose project on river Sapta Kosi and a Storage-cum-Diversion scheme on river Sun Kosi in upper catchment have been proposed in consultation with Nepal, for which field investigations for carrying out feasibility study are in progress."

6.22 The representatives of the Ministry testified before the Committee that unless construction of reservoir is taken up, *i.e.* high dams in the upstream of these rivers – the flood problem cannot be solved fully. However, the locations of the reservoirs lie in Nepal.

6.23 When the Committee asked for updated details of the creation of reservoirs by the Government/GFCC in Nepal, indicating the capacities, scheduled dates and present stage of completion of Kosi Dam, Pancheshwar Dam and Gandak project, the Ministry furnished the information as reproduced below:

"(a) Pancheshwar Multipurpose Project :

India and Nepal had signed a Treaty known as Mahakali Treaty in February, 1996 with Pancheshwar Multipurpose Project as the centrepiece of the Treaty. Required field investigations for the Pancheshwar Multipurpose Project were completed by the Joint Project Office (JPO-PI) in 2002 (except for some confirmatory tests) but the DPR of Pancheshwar Project could not be mutually finalized due to differences on certain contentious issues.

During the 3rd meeting of Joint Committee on Water Resources (JCWR) held from 29.09.08 to 01.10.08 at Kathmandu (Nepal), it was decided to set up Pancheshwar Development Authority (PDA) at the earliest for development, execution and operation of Pancheshwar Multipurpose Project. The Terms of Reference (ToR) of PDA are being finalised in consultation with various Ministries including Ministry of External Affairs (MEA), Ministry of Finance (MoF) and Government of Nepal. The matter was discussed in the 4th meeting of JSTC held on 12-13th September, 2013 in Kathmandu.

The important parameters related to the project are as below:

- Location : About 2.5 km D/S of confluence of river Mahakali and Sarju.
- Type of Dam : Rock fill with clay core
- Height of Dam : 315.00 m
- Catchment Area : 9,720 sq km in India & 2,380 sq km in Nepal
- Power Generation : 5,600 MW
- Construction period : 10 Years.

(b) Sapta Kosi High Dam Multipurpose project and Sun Kosi Storage-cum-Diversion scheme:

After exchange of letter of Understanding between the two Governments in June, 2004, a Joint Project Office (JPO) was set up in August, 2004 to undertake detailed field investigations for preparation of DPR of Sapta Kosi High Dam Multipurpose Project and Sun-Kosi Storage-cum-Diversion Scheme in Nepal. The tenure of JPO-SKSKI is upto February, 2015 to complete field investigation and preparation of DPR at a revised cost of Rs. 104.78 crore.

The important parameters related to Sapta Kosi High Dam Multipurpose project are as below:

- Location : About 1.6 km U/S of Barakshetra in Nepal.
- Type of Dam : Rock fill with clay core
- Height of Dam : 269.00 m
- Catchment Area : 59,539 sq km
- Power Generation : 3,300 MW
- Cost of Project : Rs. 22,150.00 crores (at 2001 price level)

The location of dams on Gandak (Narayani in Nepal) are required to be firmed up after detailed studies specially regarding expected flood moderation on construction of these dams."

The Ministry also informed that the above projects are at DPR/conceptual stage.

6.24 When asked about the steps taken/ proposed to be taken to speed up the completion of these projects, the Ministry informed that the matter is being pursued with the Government of Nepal in the meetings of various bilateral Joint Committees namely, Joint Ministerial Level Commission on Water Resources (JMCWR), Joint Committee on Water Resources (JCWR), Joint Standing Technical Committee (JSTC) and Joint Team of Expert (JTE) for early implementation of these projects.

6.25 A Committee similar to Kosi High Level Committee (KHLC), called 'Gandak High Level Committee' (GHLC) was constituted by the Government of India on 12.11.1981 to evaluate the performance of flood protection works on the right bank of the river Gandak in Uttar Pradesh and Bihar, to guide and advise construction activities in the two States and to suggest programme of works for the year 1981-82.

6.26 Asked about the present status of GHLC, the Ministry in its written reply submitted as under:

"The Committee was renamed as Gandak High Level Standing Committee (GHLSC) vide Ministry of Water Resources letter No. 5/15/2002-ER/Ganga /1219-27 dated 21.03.2006. The Committee inspects the protection works taken up on the river every year and recommends further protection works to be executed on the river before the

next flood season. The State Governments execute the schemes on the basis of recommendations of the Committee."

6.27 The terms of reference of GHLSC include reviewing the flood control and anti-erosion works so far executed by the State Governments of Uttar Pradesh and Bihar and evaluate their performance during the floods. When asked about the details of review/evaluation of works made by GHLSC till date on flood control and anti-erosion works of Governments of Uttar Pradesh and Bihar, the Ministry submitted as under:

"It is mentioned that the jurisdiction of GHLSC is limited to the right bank embankment of river Gandak in a stretch along the border of Uttar Pradesh, Bihar and Nepal (from D/S of Gandak Barrage at Valmikinagar to AP Bundh in Uttar Pradesh). The Committee inspects the embankment and other anti-erosion works in the said stretch every year after flood and gives recommendations for works required to be taken up by two States in a coordinated manner before next flood."

6.28 Regarding the necessary remedial/ corrective measures taken by the Governments of these two States on the basis of the said reviews/evaluation of works, the Ministry further submitted as under:

"The Government of Uttar Pradesh executes the works lying in Uttar Pradesh and Nepal. The works lying in Bihar are executed by the Government of Bihar. The remedial/ corrective measures taken are mainly anti-erosion works in the form of revetment, spurs, studs, etc., which are necessary for protection of the said embankment."

6.29 Altogether 46 meetings of the GHLSC have been held so far. The last meeting of GHLSC was held on 24-25 October, 2013. The Governments of Bihar and Uttar Pradesh execute the works in their jurisdictions as per the recommendations of GHLSC. The Ministry also informed that the GHLSC had been inspecting the works in the reach of river Gandak as mentioned above prior to Monsoon periods since 1981. The State Governments of Uttar Pradesh and Bihar had executed following types of works as per the recommendation of GHLSC:

- Repair / construction of spurs
- Repair / construction of studs

- Repair / construction of revetment
- Channel Cutting

6.30 The Ministry also informed that India shares 54 rivers with Bangladesh, which have a tendency to shift their course at many places by eroding the banks. Sites of active erosion are identified by both the countries and the banks protection works for such sites are finalized by consultation among the two countries. Twenty four such sites have been identified in the Ganga basin. Irrigation and Waterways Department, Government of Bengal is taking up bank protection work for such sites under the Central Plan scheme 'River Management Activities and Works related to Border Areas'.

6.31 When asked about the updated status of the works carried on common / border rivers in West Bengal under 'River Management Activities and Works related to Border Areas', the Ministry in a written reply stated as under:

"Thirteen (13) bank protection works undertaken in Ganga basin in West Bengal for protection of twenty four (24) erosion affected sites on seven rivers, namely, Mahananda, Nagar, Punarbhaba, Atrai, Kulik, Karatowa and Tangon. These works have been completed. In addition, one scheme for de-siltation of river Ichhamati in a stretch from Bornoberia to BSF Bridge, Kalanchi along Indo-Bangladesh Border was also taken up and completed."

6.32 Regarding the significance of these bank protection works, the Ministry further submitted as under:

"The bank protection works were undertaken to arrest erosion of common/border rivers between India and Bangladesh. The work for de-silting of river Ichhamati was taken up to relieve the area from drainage congestion. These works are significant from national security/strategy point of view."

6.33 When the Committee asked about the improvements being suggested for the effective implementation of the scheme, the Ministry stated that the aspects like taking up of river bank protection works after technical appreciation and emphasis on completion of works as per schedule, would be given due consideration while implementing the scheme during XIIth Plan.

6.34 Asked further whether regular evaluation/monitoring is being made by the Government/GFCC on the pace of execution of works under the scheme, the Ministry stated as under:

"Yes, regular evaluation/monitoring is being done by the Government/GFCC on the pace of execution of works under the scheme."

PART – II

OBSERVATIONS / RECOMMENDATIONS

IMPORTANCE OF GANGA BASIN : The Committee observe that two rivers - the Alaknanda and the Bhagirathi, originating from the glacial peaks of the Himalayas at an altitude of about 7000 metres, unite near Devprayag, Uttarakhand and form the Ganga. The 'Ganga' traverses its course of 2,525 kms. (1450 kms. in Uttar Pradesh including Uttarakhand, 110 kms. along Uttar Pradesh-Bihar border, 445 kms. in Bihar and Jharkhand and 520 kms. in West Bengal) to its outfall into the Bay of Bengal. The Ganga plays vital role in providing water for irrigation, drinking, industrial usage, etc., for overall development of the people of the region. It also provides a perennial source of fresh water for agriculture, fisheries and rich bio-diversity. The Committee further note that a broad analysis by Reserve Bank of India (RBI)'s data for food grain production during 2000-01 to 2010-11 reveals that the food grain output in the Ganga basin during the period was in the range of 48 to 54 percent of the national food grain production, whereas its catchment area is only 31 percent of the total catchment area of all the basins in the country. This fact leaves no doubt in one's mind that the Ganga basin is the bread basket of India. Taking note of the important role played by the river Ganga in the economic, social, cultural, religious and ecological life of India, the Committee desire to impress upon the Ministry the need for evolving a long-term comprehensive policy and planning to ensure judicious and efficient utilisation of water resources of the river Ganga and its tributaries commensurate with the importance the Ganga occupies in the national life. Such a policy be evolved after due consultation with the Planning Commission and Ministries of Agriculture, Environment and Forests, Energy, Rural Development etc. and the riparian States which would serve as mandatory policy

guideline for all Ganga basin States. The Committee would like to be apprised of action taken by the Ministry in this regard at the earliest.

2. UTILISABLE WATER RESOURCE, ITS USAGES AND ANNUAL DISCHARGE OF RIVER GANGA : The Committee note that the Ganga is the master drain of the Ganga basin States. It drains a total catchment area of 10.68 lakh sq. km., out of which 8.61 lakh sq. km. lies in India which is 26 percent area of our country. They also note that as per the National Commission on Integrated Water Resources Development and Planning (NCIWRDP), the annual average flow of Ganga basin is 525.02 Billion Cubic Metre (BCM). Out of this, the utilizable water resource has been assessed to be around 250 BCM. The Committee further note that the data pertaining to annual flow of river Ganga as observed at Farakka site do not establish any statistically significant trends regarding changes (increase or decrease) in total annual discharge of river Ganga since 1947. The Committee desired to be apprised of the State-wise percentage usages of water resource for irrigation and hydroelectric power in Ganga basin area. However, they are dismayed that the relevant information in this regard is not available with the Ministry. Recognising that an updated, authentic and comprehensive data base is a *sine qua non* for initiating any meaningful developmental work in the country, the Committee recommend that the Ministry should take urgent action for compilation of updated, authentic and comprehensive information, State-wise, pertaining to usages of water for irrigation, drinking and hydroelectric power, etc., in the Ganga basin. The Ministry should also establish a dedicated website on which the above information is available so that the same can be accessed by the public at large and stake-holders, viz. farmers, planners, economists, meteorologists, etc. in the country.

3. CREATION OF STORAGES FOR INCREASING UTILIZATION OF WATER : The Committee note that only 63.28 BCM of the 250.00 BCM of utilisable surface water is presently utilised, indicating that an estimated 186.72 BCM of the basin's utilisable surface water is going waste into the sea/neighbouring country which could be arrested for utilisation in the country. Further, an additional storage of 7.65 BCM would be created through projects which are under construction in the Ganga basin. The Committee also note the Ministry's reply that water discharge from Ganga basin rivers into the sea/neighbouring country in 'non lean season' can be arrested with the creation of sufficient storages in upper catchment and transferring water from the water-surplus river basins to the water-deficit river basins. In this connection, the Ministry informed the Committee that a continuous dialogue is being maintained by the Government of India with Nepal for building storage projects in Nepal, given the fact that due to topographical constraints (i.e. flat terrain), building storages in the Gangetic plain areas is not feasible. To concretise storage creation in Nepal, 5 projects viz. Pancheshwar Multipurpose Project, Sapta Kosi High Dam Multipurpose Project, Sun Kosi Storage-cum-Diversion Project, Kamala Dam Project and Bagmati Project have been identified by the Ministry. However, the Committee are dismayed to note that these storage projects are at conceptualization stage only. Further, whereas annual flood fury is ravaging Uttar Pradesh and Bihar year after year causing untold misery to the people, the progress report of the Ministry in this regard has been nothing but dismal. Whereas the field investigations for Pancheshwar Multipurpose Project have been reported to be completed, the field investigations for Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage-cum-Diversion Project and Feasibility Level study of Kamala Dam Project and Preliminary study of Bagmati Project in Nepal are still stated to be in

progress. Taking due note of the gravity of the annual flood situation in Uttar Pradesh and Bihar, the Committee urge the Ministry to make sustained all-out efforts for accelerating the pace of implementation of the storage creation in Nepal. The Committee also recommend that the Ministry/GFCC draw up, in consultation with the State Governments of Uttar Pradesh and Bihar, detailed road-map for completion of each of the above 5 projects within given timelines under intimation to them.

4. CREATION OF ADDITIONAL STORAGE CAPACITY THROUGH IMPLEMENTATION OF RRR SCHEME : The Committee note that a storage capacity of 48.68 BCM has been created through the completed projects in the Ganga basin and an additional capacity of 7.65 BCM would be created through projects under construction in the basin which can be useful for cushioning the floods to some extent. The Committee further note that due to flat terrain of the Ganga basin, Ministry does not favour building of barrages in the river itself at intervals of about 3-5 kms. because such barrages would create some inundation in the densely populated Gangetic plains. Consequently, water bodies viz. lakes and ponds, etc., are considered an option for storing water available locally mainly during flood season, and hence the Ministry formulated/implemented a pilot scheme 'National Project for Repair, Renovation & Restoration (RRR) of Water Bodies directly linked to Agriculture' during the Xth Plan. The Scheme of RRR works in 10,000 water bodies with a Central Assistance of Rs.6,235 crore has been approved for continuation during the XIIth Plan. The scheme includes comprehensive improvement of water bodies, catchment area treatment and capacity building of stake holders and increased availability of drinking water. The Committee desire to be apprised of the updated position regarding implementation of RRR Scheme, including total physical and financial achievements made Plan-wise and State-wise since Xth Plan till December, 2013 and the

targets for the next two years in Ganga basin States. They also would like to know the additional storage capacities created through RRR scheme till December, 2013 for flood moderation and cushioning in the Ganga basin States.

5. ROLE OF INTER LINKING OF RIVERS PROGRAMME IN RESERVOIR CREATION :

The Committee note that as part of the Inter Linking of Rivers (ILRs) programme, a series of reservoirs have been planned to be created in Nepal or in the foot hills of the Himalayas. The Committee hope that these links would be able to harness the waters of the Ganga and its tributaries before going into the sea/neighbouring country and also serve as effective mechanisms for flood moderation / cushioning in the Ganga basin States. The Committee further note that 14 links under Himalayan component of ILR scheme have been identified. While Feasibility Reports (Indian portion) of two links have been completed, the Survey and investigation works (Indian portion) of 7 links have been completed and the field works of remainder links, except 1 link which lies entirely in Nepal, are under progress. The Committee are however, unhappy to note that the work on the Kosi-Mechi link which lies entirely in Nepal, could not be initiated for the simple reason that it lies entirely in Nepal. They are also dismayed to note that no time-frame/schedule has been fixed for completion of Himalayan component of ILR scheme by the Ministry giving the plea that ILRs are at conceptualization stage only and that the same would be fixed while finalising their Detailed Project Reports (DPRs). Noting further that the Indian Government is in dialogue with Nepal and Bhutan through bilateral mechanism for expediting field works for completion of DPRs of the links involving these countries, the Committee recommend that the implementation of ILRs and storage projects in Nepal and Bhutan be taken up with topmost urgency and seriousness by the Ministry by working out implementable time-schedule for their

completion in collaboration with the Governments of those countries especially in case of Kosi-Mechi link for which work has not been initiated till now.

6. FLOOD-AFFECTED AREAS AND MAGNITUDE OF DAMAGE : The Committee note that devastating flood is a recurring feature in the 11 Ganga basin States. The Committee observe that the XIIth Plan Working Group of Flood Management and Region Specific Issues compiled the maximum flood effected area in the country as 49.815 million hectare, out of which flood affected area for Ganga basin States was compiled as 23.728 million hectare viz. Bihar (4.986 mha), Jharkhand (0.266 mha), Madhya Pradesh (0.377 mha), Chhattisgarh (0.089 mha), Uttar Pradesh (7.34 mha), Uttarakhand (0.002 mha), Delhi (0.458 mha), Haryana (1.000 mha), Rajasthan (3.260 mha), Himachal Pradesh (2.870 mha), and West Bengal (3.080 mha). Regarding the magnitude of losses caused by recurring floods, the Committee observe that between 2000 to 2012, 200.312 million population were affected and a total damage of crops, houses and public utilities amounting to Rs.36,744.142 crore has been caused in the 11 Ganga basin States. The Committee also note that the recurring flood scene in Ganga basin States are due to high intensity rains falling in short duration, heavy rains of long duration, high flows from upper hilly regions, inadequate river capacity and inadequate river embankments, etc. The Ministry could not furnish the information regarding: (i) the average annual rain fall, total cropped area, flood prone area and flood protected area in the Ganga basin in 1972 and as on 18.10.2013, and (ii) the proportion of the total flood prone area falling under cropped area, saying that the same were being collected. Reiterating the need for compiling such a vital information for policy planning and programme execution, the Committee recommend that the desired information may be furnished to the Committee within three months of the presentation of this report

alongwith details of relief and rehabilitation package given to the flood affected areas in Ganga basin during the last 5 years, year-wise.

7. **SCIENTIFIC ASSESSMENT OF FLOOD PRONE AREAS :** The Committee note that the Ministry of Water Resources has constituted an Expert Committee for scientific assessment of flood-prone areas in the country and it has also been decided to set up Regional Committees for compilation and assessment of State-wise flood-prone areas. The Committee would like to see a speedy completion of the process of setting up Regional Committees for compilation and assessment of State-wise flood-prone areas. They also desire to be apprised about the report of the Expert Committee set up for scientific assessment of flood prone areas in the country as and when it is presented.

8. **FLOODING IN FARAKKA BARRAGE AREAS :** The Committee observe that the Farakka Barrage is a barrage across the river Ganga, which is about 17 kms. from the Bangladesh border near Chapai Nawabganj district. Recently, excess release of water led to flooding in Lalgola block, which was compounded by the problem of non-maintenance of the embankment of the canal which is about 40 kms. long from the Barrage to the Bhagirathi-Hooghly, leading to flooding of villages and submergence of huge acres of land. A total of Rs.520.00 lakh has been allocated by the Government for repair and maintenance of the Farakka Barrage during XIIth Plan, out of which an expenditure of Rs.135.11 lakh has been incurred so far. The Committee desire the Ministry to make an on-the-spot study expeditiously of the safety, reliability and efficiency of the canals and embankments of Farakka Barrage specially in Lalgola block of Murshidabad district to ensure that such flooding do not recur in future. They would like this work to be completed well before the onset of Monsoon season, so that necessary repair and maintenance works (if any) may be taken up by the concerned

departments/organisations in time. The Committee would like to know the follow-up measures taken in this regard.

9. FLOOD MANAGEMENT IN GANGA BASIN STATES : Taking note of : (i) dire necessity of tackling the recurrent devastations caused by floods year after year in the Ganga basin and to alleviate human miseries and also to reduce and ultimately eliminate colossal damages to crops, houses and public utilities; and (ii) the provisions of the National Water Policy, 2012 for rehabilitation of natural drainage systems, the Committee recommend that the Ministry/Central Water Commission should in consultation with all the basin States chalk out a time-bound, implementable programme of action to identify those drainage systems, viz., rivers/streams, canals, etc., which need immediate rehabilitation and adopt measures to be taken by the concerned agencies/authorities for their repair and restoration. The progress of works undertaken in this regard should be reviewed after every six months.

10. ROLE OF GLOBAL CLIMATE CHANGE IN GANGA BASIN FLOOD : The Committee note with alarm that a study made by the Indian Network of Climate Change Assessment (INCCA), a network-based scientific programme of Ministry of Environment and Forests (MoEF), on the impact of climate change on water resources in four regions of the country including the Himalayan region indicated that the flooding could vary from 10 percent to over 30 percent of the existing magnitudes in most of the regions by 2030. They also note that the Ministry of Water Resources is also currently taking up basin level studies in this regard, and that the Central Water Commission (CWC) has taken up two studies, i.e. (i) Inventory and monitoring of glacial lakes and water bodies in Himalayas affecting India and (ii) development of snowmelt-runoff models with the National Remote Sensing Centre, Hyderabad to which the National Institute of Hydrology

is providing necessary inputs. The National Water Policy, 2012 underlines the need for factoring the input of climate change into all projects. The policy also envisages that planning and management of water resources structures such as dams, flood embankments, tidal embankments, etc., should incorporate coping strategies for possible climate change. The Ministry has constituted a Committee to review the guidelines for preparation of Detailed Project Reports (DPR) incorporating the aspect of climate change. The Committee therefore recommend that the process of reviewing the guidelines for DPRs be completed expeditiously and corrective measures taken urgently to ward off or minimise the adverse impact of climate change on the river basin systems.

11. OBJECTIVES AND FUNCTIONS OF GFCC : The Committee observe that the Ganga Flood Control Commission (GFCC), a subordinate office of Ministry of Water Resources was created in 1972 to act as the Secretariat and executive limb of the Ganga Flood Control Board (GFCB) and to deal with the floods and its management in the Ganga basin States. With its headquarters located at Patna, the mandate of the GFCC includes examination of all major and medium flood control, drainage, anti-water logging and anti-erosion schemes of the Ganga basin States except for the schemes of the States of Haryana, Uttar Pradesh and Delhi on the river Yamuna in the reach from Tajewala to Okhla barrage. The Committee also note that the GFCC has undertaken studies for assessment of adequacy of waterways under the road and rail bridges aimed at determining additional waterways required for reducing drainage congestion to a reasonable limit. This study has been completed for all 23 river systems in the Ganga basin except the Tidal River System and the Ganga Main Stem. For the Ganga Main Stem, the study has been completed for the stretch between Haridwar and outfall. These reports have been circulated to the Ganga basin States and the concerned departments

of the Union and State Governments including the Ministry of Railways for follow up action. The Committee desire that the study be undertaken / completed at the earliest in respect of the Tidal River System and the remaining part of the Ganga Main Stem as well. They also further desire the Ministry to keep a tab on follow up action taken by the concerned Ganga basin States/Departments of Union and State Governments including the Ministry of Railways in this regard.

12. ORGANISATION AND MANPOWER STRENGTH OF GFCC : The Committee note that the Ganga Flood Control Commission has original sanctioned staff strength of 101 personnels comprising 23 Group 'A' Officers, 13 Group 'B' (Gazetted) Officers and 65 other supporting staff. The Committee were informed that as on 01 October, 2013 (after deemed abolition of 32 posts), the sanctioned staff strength has been reduced to 69 comprising 18 Group 'A' Officers, 04 Group 'B' (Gazetted) Officers and 47 other supporting staff, out of which there are 16 vacancies including 4 in Group 'A' Officers, 1 in Group 'B' (Gazetted) Officers and 11 other supporting staff. The Committee have been further informed that in addition, there are 19 posts of work-charged establishment. The Ministry in their reply informed that the present manpower strength of GFCC is adequate for its smooth functioning or for achieving its objectives and mandate. The Committee also note the Ministry's reply that filling up of vacant posts and introduction of appropriate capacity building programmes for the officers/staff of GFCC would enhance the effectiveness of the GFCC. They, therefore, desire that urgent necessary steps be taken for filling up the vacant posts and introduction of appropriate capacity building programmes for the officers and staff of the GFCC. The Committee would like to be apprised of the action taken in this regard.

13. MEETINGS OF GFCC : The Committee note the reply of the Ministry that the meetings of GFCC are held regularly for interaction among Ganga basin States and that 44 meetings have been held so far, including the last meeting held on 12 March, 2013. Considering the gigantic nature of challenges posed by the recurrent floods in the Ganga basin, the number of meetings held by GFCC is much too less and inadequate. Further, a perusal of the summary record of the 44th meeting of the Ganga Flood Control Commission held on 12 March, 2013 reveals that certain serious loopholes have been impeding the works of GFCC, which *inter alia* include flood management scheme being not formulated as per the guidelines of GFCC, non-submission of Detailed Project Reports (DPRs) according to guidelines, non-submission by Ganga basin States of quarterly physical and financial progress report of various schemes being implemented with Central Assistance, etc. The Committee urge the Ministry/GFCC to vigorously pursue with the concerned States for plugging the loopholes indicated above so that the onerous task of implementation of flood protection and management by the Ganga Flood Control Commission is carried out without any let-up or hindrances. Further, the Ministry/GFCC needs to strengthen its coordination with the concerned State Governments by increasing the frequency of meetings with them, i.e. by holding regular meetings atleast twice a year, namely, one meeting before the onset of Monsoon season to chalk out detailed coordinated strategies, measures and plan of action for coping with the ensuing Monsoon rains for each State of the Ganga basin, followed by another meeting at the end of the Monsoon season to review and evaluate the effectiveness of the strategies and measures taken during the Monsoon season, and also prepare new or modified strategies/measures as may be warranted by the flood trends. The Committee are also of the considered view that apart from other meetings and consultations that

may be held as per the exigencies of the situation, a separate Cell should be created in the Ministry solely for handling the works of liaisoning/coordination with the States so that the Ministry/GFCC and the concerned States work smoothly and in tandem to achieve their declared goals and objectives. The Committee would like to be apprised of action taken in this regard.

14. **FINANCIAL POSITION OF GFCC :** The Committee note that as an organisation of Ministry of Water Resources, the expenditure on establishment and activities of Ganga Flood Control Commission is met from the allocation made for the Plan scheme 'River Management Activities and Works Related to Border Areas'. According to the Ministry, a total expenditure of Rs.20.48 crore was incurred by GFCC from the period 2007-08 to 2011-12 whereas during XIIth Five Year Plan, a total expenditure of Rs.4.80 crore during 2012-13 and Rs.2.44 crore (as on 01.10.2013) during 2013-14 had been incurred. The Expenditure Finance Committee (EFC) has approved an amount of Rs. 45 crore for the activities of GFCC during the XIIth Five Year Plan against the demand of Rs. 68.80 crore made by the Ministry of Water Resources. The Committee were informed about the adequacy of funds to meet the expenditure on establishment and to fund the activities of GFCC. The Committee hope that the Government will ensure the availability of adequate financial resources with the GFCC so as not to hamper its activities for Flood Management in Ganga Basin States.

15. **MASTER PLANS FOR FLOOD PROTECTION AND FLOOD MANAGEMENT :** The Committee note that the main function of the Ganga Flood Control Commission (GFCC) is to prepare Master Plans for flood protection and flood management in the Ganga basin States. The GFCC has prepared Master Plans for all the 23 rivers which are tributaries of the Ganga. Notably, the GFCC being an Advisory Commission, the

execution of all works suggested under the Master Plans has to be carried out by the respective State Governments which are required to undertake works including embankments, drainage schemes, even town protection works, etc. through the Plan schemes. The Committee are dismayed to note that although State Governments are generally formulating flood management schemes keeping in view the Comprehensive Master Plans circulated by GFCC to all the concerned Ganga basin States for flood management, the information regarding status of implementation of Master Plans 'is not forthcoming from the State Governments despite several efforts including several reminders during the meetings of GFCB/GFCC'. Besides, although the Ministry requested six severely flood-affected Ganga basin States, namely Bihar, Uttar Pradesh, West Bengal, Jharkhand, Himachal Pradesh and Uttarakhand to constitute Implementation Committees to ensure time-bound implementation of the recommendations of the Comprehensive Plans, yet only the States of Bihar and West Bengal have set up such committees so far. Taking note of the tardy pace of execution of the Master Plans by the Ganga basin States, the Committee desire the Ministry/GFCC to keep tab on the concerned State Governments through frequent meetings, sending written reminders, etc. so that the Master Plans do not remain mere paper works in the preserve of the State Governments. Noting that four remaining severely flood-affected States have not taken needful action for constituting Implementation Committees, the Committee urge the Ministry/GFCC to pursue vigorously with these States for speedy execution of the Master Plans for flood protection and management in Ganga basin States. The Ministry may also consider mentioning the names of defaulting States in this regard on the websites of both the Ministry and the GFCC so that general public and the

stakeholders may also bring pressure to bear upon these States so as to expedite implementation of the Master Plans.

16. **EMBANKMENTS :** The Committee note that embankments of the length of 17,826 kms. have been constructed in the Ganga basin States so far. The Committee also note that the details of the cost involved in the construction of embankments have not been compiled. Further, the Committee note that although embankments have certain inherent disadvantages, the demand for providing flood embankment has been on the increase and since the area behind are protected from frequent flooding, they are available for cultivation during Monsoon as well as Rabi seasons. Moreover, embankments protect built-up area in the towns and cities. Noting that the total area protected from flood is only 9.40 mha. out of the total area of 20.81 mha. liable to floods in the Ganga basin States, the Committee urge the Ministry to extend the coverage of flood protection by encouraging the concerned States to construct more embankments in the Ganga basin States expeditiously. The Committee also desire the Ministry to furnish within 3 months of the presentation of this report, the expenditure incurred on the construction of embankments so far.

17. **MAINTENANCE OF EMBANKMENTS ON RIVER BAGMATI :** The Committee note that a team led by Chairman, GFCC and Member (RM), CWC inspected the embankment works on river Bagmati in Sitamarhi and Sheohar districts (Bihar) on 27 November, 2013. The inspection team highlighted several shortcomings in the embankments, including absence of maintenance of the embankments since 2008 and made several recommendations regarding works required to be undertaken by the concerned authorities in this regard. The Committee deplore that the concerned basin State has not taken necessary corrective measures keeping in view the disastrous floods in North

Bihar caused by a breach in the Eastern Afflux Bund of Kosi barrage at Kusaha in Nepal, necessitating works to be taken up for breach closure at a staggering Rs.115.00 crore during 2008-2011. The Committee also deplore the callousness on the part of the concerned authorities viz. the Ministry/GFCC/State Government of Bihar regarding non-maintenance of the embankment on river Bagmati after its completion in 2008 leading to its deterioration at many locations in view of the fact that there is high level of risk of occurrence of similar catastrophe on river Bagmati as it happened on the Kosi river. The Committee, therefore, strongly recommend the Ministry/GFCC to take vigorous, timely action for implementation of the recommendations of the inspection team led by Chairman, GFCC and Member (RM), CWC regarding embankments on river Bagmati so that all necessary works may be completed before the onset of ensuing Monsoon. The Committee would like to be apprised about the action taken in this regard.

18. **RENOVATION AND MAINTENANCE OF EMBANKMENTS** : The Committee also note that a provision has been made in the XIIth Plan for re-visiting the entire embankments again. The longevity and durability of vulnerable embankments is proposed to be enhanced by the use of modern geo-textile/geo-synthetic material/geo-bags etc., which are environment friendly and also provide safety against puncture, breaches and erosion. Notably, these techniques have been used in many places viz. Malda, Nadia, 24 Pargana districts of West Bengal, works undertaken by Farakka Barrage Project on main stem of Ganga and river Swan in Una district of Himachal Pradesh, so that the embankments in the country stand strong enough to withstand the ravages of the swelling floods during the Monsoon season and the chances for embankment breaches are minimized and the inhabitants are protected from the unexpected calamity. The Committee therefore, recommend that the

Ministry/CWC/GFCC should immediately take up detailed morphological studies of all the rivers in the 11 Ganga basin States and complete this exercise within a definite time frame with a view to achieve better results in building, renovating and maintaining revetments, spurs and embankments in the area to control and mitigate the disaster caused by floods.

19. AFORESTATION OF EMBANKMENT ZONES AND PERIODIC INSPECTION OF EMBANKMENTS : The GFCC had circulated Master Plans to the concerned Ganga basin States wherein afforestation of the embankment zones and turfing and plantation to the extent practicable for better reinforcement of soil on embankments in all Ganga basin States was emphasised. The Committee desire that proper maintenance of embankments through afforestation in the embankment zones would go a long way to increase the longevity and durability of embankments and, therefore, the States should be encouraged for embarking on such programmes. Additionally, periodic inspection of the quality and strength of embankment should be undertaken by the concerned departments/agencies and updated information sent to the Ministry/GFCC for taking necessary action before the onset of Monsoon every year to facilitate timely repair and renovation, where needed. The Committee would like to be apprised of concrete steps taken in this regard.

20. EXECUTION OF FLOOD PROTECTION SCHEMES / WORKS : The Committee note that for execution of schemes/works, the Technical Committees suggest to start the work in December or latest in January, when the water level in the river is low for better sustainability of flood protection works. However, most of the times flood protection works get delayed due to non-submission of Techno-economically sound proposals, delay in compliance of technical observations of GFCC, non-completion of formalities

like timely land acquisition, delay in submission of Utilisation Certificates and so on by the State Governments. The Committee were apprised that the matter was brought to the notice of concerned State Governments at various occasions like meetings of GFCB/GFCC besides monitoring visits and through holding meetings with concerned officers of State Governments. Further, the Committee note that the GFCC prepared compendium of guidelines/specifications, updated the same in January, 2004 and circulated to all concerned to follow the same during the implementation of the schemes, which is helpful in stabilization of the executed works. However, no specific response/suggestions in regard to guidelines/specifications has been received from any State Government. The Committee also note the Ministry's reply that there are some deficiencies in information flow regime between the Central and State Governments as a result of which a clear picture of Master Plans *vis-à-vis* their implementation is lacking thereby necessitating a need to streamline the same. For ensuring speedy execution of flood protection works in Ganga basin States, the Committee recommend that :

(a) the Ministry/GFCC impress upon the States through regular correspondence and frequent meetings with the concerned officials of the States, the need for taking up flood protection works well before the onset of Monsoon;

(b) the Ministry should insist on strict compliance of guidelines/specifications issued by the GFCC for implementation of Schemes by the States; and

(c) the information flow system between the Ministry/GFCC and the States be streamlined so that there is no gap in the flow of information between them.

21. **ANTI EROSION MEASURES :** The Committee note that erosion causes severe damage to soil fertility. Silt discharged due to erosion silts up farmlands; chocks lakes, reservoirs and canals; clogs up and raises river beds; blocks navigation passes;

decreases the benefits of water conservancy facilities; and aggravates flood and water logging. All these adversely affect the development of economy and production in the country. The Committee, therefore, urge the Ministry to impress upon the State Governments the need to check erosion by taking necessary measures on priority basis such as : (i) planting trees, bushes, grasses, grass-shrub vegetation, etc. through plantation and also aerial sowing in inaccessible terrains; and (ii) taking appropriate engineering measures such as building intercepting ditches/check dams/silt-trap and/or construction of bench terraces, etc.

22. **CENTRALLY SPONSORED ANTI-EROSION SCHEMES :** The Committee observe that as part of the implementation of the recommendations of Task Force 2004, the Union Government had expanded their role in flood sector and during Xth Plan it had approved the Centrally Sponsored Scheme 'Critical Anti-Erosion Works in Ganga basin States' for Rs.305.03 crore and State Sector Scheme 'Critical Flood Control and Anti-Erosion Schemes in Brahmaputra and Barak Valley States' for Rs.225.00 crore and under which immediate Short-Term-I measures as recommended by Task Force 2004, were undertaken. Taking note of the great significance of such anti-erosion schemes, the Committee recommend that the Ministry make all out efforts for full, effective and speedy implementation of these schemes. The Committee also urge the Government to implement and further improve upon these schemes in future. They also would like to be apprised of achievements made under the two schemes.

23. **IMPLEMENTATION OF FLOOD MANAGEMENT PROGRAMME UNDER CENTRAL PLAN :** The Government launched in September 2007 'Flood Management Programme (FMP)' a State Sector Scheme under Central Plan with an outlay of Rs.8,000.00 crore for providing Central Assistance to the State Governments for works related to river

management, flood control, anti-erosion, drainage development, flood-proofing works, restoration of damaged flood management works and anti-erosion works in coastal areas. A total of Rs.3,566.00 crore has been released as Central Assistance under this programme as on 31.03.2012. The Committee were apprised that the Government has approved continuation of FMP during XIIth Plan with an increased outlay of Rs.10,000.00 crore under which projects for catchment area treatment having objectives of flood management would also be provided Central Assistance besides the type of works funded during XIth Plan. While appreciating the fact that the allocations for FMP has been increased from Rs.8,000.00 crore during XIth Plan to Rs.10,000.00 crore during XIIth Plan, the Committee note that out of 420 works approved during XIth Plan, only 252 works were completed during the same period. Further, although an allocation of Rs.10,000.00 crore has been made for XIIth Plan, only Rs.263.71 crore had been released as Central Assistance till 31.10.2013 which include Rs.54.48 crore for Bihar, Rs.19.92 crore for Himachal Pradesh, Rs.4.27 crore for Jharkhand, Rs.45.66 crore for Uttar Pradesh, Rs.24.25 crore for Uttarakhand and Rs.54.86 crore for West Bengal. No funds have been released for Haryana, Rajasthan, Madhya Pradesh, Chattisgarh and NCT Delhi which are also part of the Ganga basin States. The Committee also note that no new scheme has been approved under Flood Management Programme during XIIth Five Year Plan so far. Noting that as per the projection made by States/UTs, an additional area of 6.0 mha. is likely to be provided reasonable degree of protection against floods under FMP during XIIth Plan, the Committee desire the Ministry to pull up its socks and make renewed efforts for effective implementation of Flood Management Programme during XIIth Plan. Accordingly, they recommend that the Ministry short-list flood management schemes of States/UTs capable of being implemented within the XIIth Plan period and

expedite the release of funds for these schemes for achieving better results in this regard.

24. **ASSESSMENT OF FLOOD PRONE AREAS BY EXPERT COMMITTEE :** According to the Ministry, an Expert Committee under the Chairman, Central Water Commission was constituted in July, 2012 for scientific assessment of flood-prone areas in the country. The Committee were apprised that the report of the Expert Committee was yet to be submitted although during its 2nd meeting held on 27 June, 2013, the Expert Committee finalised the methodology, classification and criterion to work out the assessment of flood-prone areas in the country. The Committee hope that the Expert Committee would expedite its report so that necessary follow up action is taken by the Government on the report of the Expert Committee. The Committee would like to be apprised of the outcome thereof.

25. **RECOMMENDATIONS OF 'WORKING GROUP ON FLOOD MANAGEMENT AND REGION SPECIFIC ISSUES' :** The representatives of the Ministry deposed before the Committee that the Union Government has been making assessment of the adequacy of flood management measures through various working groups for specific Five Year Plans. For XIIth Plan, the Government had set up 'Working Group on Flood Management and Region Specific Issues' which recommended various measures for flood management. When asked to furnish the recommendations of this Working Group including the status of implementation thereof, the Ministry was unable to do so. The Committee, therefore, urge the Ministry to furnish the recommendations of the 'Working Group on Flood Management and Region Specific Issues' including the up to date status of the implementation of each of the recommendations.

26. **FLOOD FORECASTING AND FLOOD PREPAREDNESS** : According to the Ministry of Water Resources, the flood situation in the country including Ganga basin States is monitored by the Central Water Commission every Monsoon. Based on the information provided by the CWC, the GFCC prepares weekly summary of flood situation in the Ganga basin States. Further, based on the flood information received from the CWC and the GFCC, the various agencies like NDMA, Ministry of Home Affairs, Ministry of Defence and the officials of State Governments are apprised of the flood situation and trend of rivers during emergency meetings of high level inter-ministerial forums like National Executive Committee headed by the Home Secretary. The Ministry claimed that there is accuracy of more than 96 percent in flood forecasting by the CWC, which is comparable with the best international practices. At present, the Central Water Commission issues flood forecasts at 87 stations in Ganga basin States of Uttarakhand (3), Uttar Pradesh (35), Bihar (32), Jharkhand (5), Madhya Pradesh (1), Haryana (1), NCT Delhi (2), West Bengal (8) during Monsoon period every year. The forecasts are disseminated to various user agencies namely State Revenue/Civil authorities, Water Resources/Irrigation/Flood Control/Disaster Management authorities of respective State Governments, and Road and Rail traffic authorities. As emphasized in the National Water Policy, 2012, flood forecasting is very important for flood preparedness and, therefore, it should be expanded extensively across the country specially in the Ganga basin States which are facing perennial flood ravages. The Committee recommend that the present flood forecasting infrastructure should be modernized using real time data acquisition system and linked to forecasting models. The Committee are pleased to note that the Ministry has, during XIIth Plan, proposed modernization and expansion of its flood forecasting network to include additional reservoirs under inflow forecasting

network, preparation of Digital Elevation Maps (DEMs) in Uttar Pradesh, Bihar and West Bengal. They hope and desire completion of these proposals in the near future so that tangible improvements are visible in flood forecasting scenario specially in the flood-prone Ganga basin States.

27. ENQUIRY INTO DISASTROUS FLOOD OF UTTARAKHAND : The Committee note the reply of the Ministry that the disastrous flood of Uttarakhand in 2013 was due to combination of one or more factors, i.e. (i) melting rate of glacier being high during the period, (ii) unprecedented early, prolonged and heavy to very heavy rainfall in the catchment areas, and (iii) occurrence of snowfall prior to rainfall which melted rapidly due to rainfall. As per the information of the Ministry, 1,08,653 persons were affected, 580 people killed, 4,726 houses fully damaged, and 9,470 cattle were lost. Responding to the Committee's query, the Ministry further informed that the Central Water Commission had issued timely (water) level forecasts to the local administration for the stations located at Rishikesh and Haridwar, besides sharing the water-level data of 11 other stations in the State with the State Government. The Ministry also claimed that India Meteorological Department (IMD) had issued forecast for heavy rainfall in Uttarakhand during 14th to 18th June, 2013. However, the Committee are pained to note that in spite of the claims by the Ministry, a disaster of such a magnitude took place in the Ganga basin, leaving behind unprecedented destruction and misery in its trail. The Committee are of the firm view that with increased efforts and research by India Meteorological Department along with stepping up of periodic monitoring of glacial lakes and water bodies in Himalayas by the National Remote Sensing Centre (NRSC), Hyderabad, advance information regarding occurrence of such natural calamities can be gathered and passed on to concerned authorities in time to avoid or minimize the loss of life and

property as a result thereof. Notably, the present form of periodical monitoring of glacial lakes and water bodies does not help in fast changing weather triggered natural catastrophe such as cloud bursts. The Committee, therefore, recommend that the Ministry should step up its coordination with associated organisations/departments like Central Water Commission, India Meteorological Department, National Institute of Hydrology, National Remote Sensing Centre (NRSC), etc., for undertaking appropriate research into such climatic phenomenon as cloud bursts, rainfall pattern, snow melt pattern, etc., in the Himalayas so that the results may be gainfully utilised for making better/more accurate weather predictions thereby helping the concerned departments/organsiations to make advance preparations for natural catastrophe as occurred in Uttarakhand. The Committee also note that the Ministry of Water Resources has set up a Committee under Chairman, GFCC to find out the causes for severe destruction in Uttarakhand due to flood and erosion during 16-17 June, 2013 and that the report has already been submitted by the Committee. The Committee desire the Ministry to take appropriate action on the recommendations of this report and apprise them accordingly.

28. FLOOD PLAIN ZONING : The Committee note that the flood plain zoning measures aim at demarcating zones or areas likely to be affected by floods of different magnitudes or frequencies of probability levels and specify the types of permissible development in these zones so that whenever the floods actually occur, the damage can be minimized. However, although a Model Draft Bill for Flood Plain Zoning Legislation was circulated by the Union Government to all the States in 1975 for implementation of Flood Plain Zoning approach, only the States of Manipur, Rajasthan and Uttarakhand have enacted legislations about Flood Plain Zoning. Regarding the progress of

implementation of Flood Plain Zoning legislation in Ganga basin States, the Committee note that only the States of Uttarakhand and Rajasthan have enacted the Bill. Uttarakhand is taking steps for implementation of the Bill while the enactment is kept in abeyance by Uttar Pradesh. Curiously enough, the States of Jharkhand, Madhya Pradesh and NCT Delhi have not felt the requirement of the Bill, whereas it is under consideration in Himachal Pradesh and West Bengal. Besides, the State of Bihar informed its inability to enact the Bill in view of large flood-affected area whereas views of Chhattisgarh are stated to be awaited. The State of Haryana has not enacted the Bill but informed about the necessary administrative measures taken for Flood Plain Zoning. The Committee also note that at the 16th meeting of Ganga Flood Control Board (GFCB) held on 16.01.2013, the Hon'ble Union Minister of Water Resources observed that 'the present draft Bill for Flood Plain Zoning is quite old and needs revision'. The Union Minister, therefore, requested the Member States to send their suggestions expressing their views within a month or so to enable the same to be considered for revising the draft Bill. The Committee further note that at the GFCC meeting held on 12.03.2013, the Member States were reminded to send their views in this regard to GFCC at the earliest and also that the Ministry has proposed to get Digital Elevation Maps (DEMs) for flood-affected areas of Uttar Pradesh, Bihar and West Bengal in the XIIth Plan, which may be used to demarcate various flood zones. The Committee therefore, recommend that the Ministry take vigorous steps for persuading the remaining States to enact the necessary legislation in this regard without delay. Further, the Committee would like the Ministry to coordinate with these State Governments to ensure that, pending enactment of legislation in this regard, they take necessary administrative measures to prevent further encroachment of areas located in the flood plain zone. The Committee also

recommend that apart from Uttar Pradesh, Bihar and West Bengal, other States of the Ganga basin may also be included in the proposed Digital Elevation Maps (DEMs) for the flood-affected areas.

29. MONITORING, EVALUATION AND APPRAISAL OF FLOOD MANAGEMENT SCHEMES BY GFCC : The Committee note that Ganga Flood Control Commission (GFCC) monitors all Flood Management Schemes in the Ganga basin through site visits and report to the Ministry. The GFCC also advises the State Governments and that every ongoing scheme is site-inspected at least once in a year. In regard to physical progress of Flood Management Programme (FMP) in the Ganga basin, the Ministry informed that as of October, 2013, 97 Schemes had been taken up, out of which 52 were completed, 04 schemes dropped/withdrawn and 41 Schemes were still under progress since 2007-08. Further, giving reasons for poor performance of FMP in the Ganga basin, the Ministry attributed the same to availability of limited working season, disputes in land acquisition and non-submission of Utilisation Certificates (UCs) by the States in time. The Committee recommend that before giving clearance to schemes for Flood Management Programme sent by the Ganga basin States, the Ministry should ensure that necessary ground works viz. land acquisition, submission of utilization certificates, infrastructural developments, Rehabilitation and Resettlement issues, etc. are sorted out by the concerned State Governments before undertaking execution of the schemes.

30. EVALUATION STUDY OF FLOOD MANAGEMENT PROGRAMME IMPLEMENTED DURING XITH PLAN : The Committee note that the performance evaluation of the schemes operated by the Ministry of Water Resources during Xth plan for funding of flood/erosion control projects was got done through the Indian Institute of Public Administration (IIPA) and that action for performance evaluation study for Flood

Management Programme implemented during XIth Plan, has been initiated by the Ministry of Water Resources. The Committee would like to see early completion of the study by the Ministry in this regard.

31. UTILISATION CERTIFICATES : The Committee are surprised to observe that UCs for a total amount of Rs.334.54 crore were outstanding, viz. Rs.4.56 crore in Uttarakhand, Rs.16.61 crore in Bihar and Rs.313.37 crore in West Bengal. The Committee in their 17th Report on Demands for Grants (2013-14) had recommended that the UCs from the concerned organizations/departments must be obtained and also recommended to consider imposition of fines for inordinate delays in submission of the UCs. The Committee reiterate their above recommendation and urge the Ministry to keep strict vigil on the implementation/completion of various FMP schemes/projects being funded by Union Government and the timely submission of UCs by the concerned State Governments.

32. INDIA-NEPAL CO-OPERATION : The Committee note that in order to contain the flood havoc caused by Nepal-originating rivers of the Ganga basin viz. Gandak, Bagmati, Kamla, Kosi, etc., the Government of India has taken several measures in agreement with the Government of Nepal which include : (i) regular transmission of hydro-meteorological data of sites located in Nepal to India during monsoon for use in flood forecasting on Indian side in Uttar Pradesh and Bihar; and (ii) taking up schemes for several flood control projects viz. Pancheshwar Multipurpose Project, Sapta Kosi High Dam, Storage-cum-Diversion Project in Sun Kosi and a dam coupled with a barrage project in Kamla basin in Nepal territory. The Committee further note that a Task Force has reviewed the arrangements regarding transmission of Hydro-Meteorological Data and identified key stations in Nepal, requirement of modern equipment in order to have

more effectiveness in data collection and transmission for flood forecasting on Indian side. The Committee therefore, recommend that the Ministry take necessary steps for implementing the recommendations of the Task Force and keep them apprised in due course. The Joint Standing Technical Committee (JSTC), constituted in 2008 also needs to meet more frequently to address the problems.

33. CONSTRUCTION OF EMBANKMENTS IN NEPAL : The Committee note that an umbrella Committee in the name of Joint Committee on Inundation and Flood Management (JCIFM) was constituted in 2009 to implement the decisions of JSTC and also monitor the progress of works funded by Government of India in Nepal on various rivers flowing down to India and provide guidance to task group(s) and report to JSTC. The Committee are pleased to note that the works for construction of embankment in Nepal on rivers Kamla, Bagmati and Lalbakeya are under progress and they recommend that the works be completed speedily.

34. INDO-BANGLADESH CO-OPERATION : The Committee note that the Indo-Bangladesh Joint Rivers Commission (JRC) was set up in 1972 which provides a platform for resolution of common problems related to development works on common/border rivers, causing no harm to either side. They also note that 37 meetings of JRC have been held so far whose outcome include Ganga Water Sharing Treaty, 1996 with Bangladesh. The Committee appreciate the work of JRC for solving common problems related to border rivers between India and Bangladesh. Noting that there are still a few common problems which defied resolution, viz. sharing of waters of common rivers like Teesta, Feni, etc., the Committee would like the Ministry to redouble its efforts for bringing mutually acceptable solution to persisting problems between India and

Bangladesh on sharing of waters of common rivers as stated above and apprise the Committee about the outcome thereof.

35. RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS :

The Committee note that under the Plan scheme 'River Management Activities and Works related to Border Areas' taken up during XIth Plan period, the Ministry held dialogues with Nepal on setting up of Pancheshwar Development Authority (PDA) for finalization of Joint DPR of Pancheshwar Multipurpose Project. Terms of Reference (ToR) of the PDA are being finalised in the Ministry in consultation with various Ministries including Ministry of External Affairs (MEA) and Ministry of Finance (MoF). Further, the joint field investigations for preparation of DPR of Sapta Kosi High Dam, Storage-cum-Diversion Project in Sun Kosi and a dam coupled with a barrage project in Kamla basin in Nepal territory are being carried out by a Joint Project Office- Sapta Kosi Sun Kosi Investigation (JPO-SKSKI). The Committee recommend that the Ministry speedily complete finalization of Terms of Reference (ToR) of the Pancheshwar Development Authority (PDA) for finalization of Joint DPR of Pancheshwar Multipurpose Project. They also desire that the works related to joint field investigations for preparation of DPR of Sapta Kosi High Dam, Storage-cum-Diversion Project in Sun Kosi and a dam coupled with a barrage project in Kamla basin in Nepal territory which are being carried out by a Joint Project Office- Sapta Kosi Sun Kosi Investigation (JPO-SKSKI) may be completed within a definite time-frame at the earliest. Noting further that about 50 percent of bank protection works on rivers Attrai, Punarbhava, Tangon, Nagar, etc. in West Bengal and 50 percent of works on river Feni in Tripura along international border with Bangladesh have been completed, the Committee ardently hope that these works may be completed fully within this financial year 2013-14. Further, they also

observe that out of Rs.820.00 crore outlay approved for XIth Plan, the Ministry could achieve an expenditure of only Rs.721.14 crore upto 31.03.2012. The Committee, therefore, desire that due pre-planning exercise be undertaken by the Ministry and targets for achievements fixed and bottlenecks hampering project execution such as R&R issues, land acquisition, non-submission of UCs, etc. be removed so that the works/projects taken up under the scheme 'River Management Activities and Works related to Border Areas' achieve full utilization of its allocated outlay during XIIth Plan.

36. FLOOD PROTECTION WORKS ON KOSI RIVER : The Committee note that the Kosi High Level Committee (KHLC) was constituted by the then Irrigation Department, Government of Bihar in 1978 under the chairmanship of Chairman, GFCC to review/examine the protection works already executed on the river and recommend protection measures to be taken before the next flood season. They further note that the Committee is inspecting every year the protection works taken up on the river and make recommendations regarding protection works to be executed by the State Governments on the river before the next flood season. However, a breach in the Eastern Afflux Bund at 12 kms. at Kusaha, Nepal occurred on 18.08.2008 in Kosi Barrage for which works for breach closure were taken up by the Government of India with an expenditure of Rs.115.00 crore during the years 2008-09, 2009-10 and 2010-11. The Committee also note that the GFCC took a lead role in providing technical assistance in the Kosi breach closure works that were carried out in the Eastern Afflux bund of Kosi Barrage as well as monitoring of execution of works. No further breaches have occurred in the Kosi Barrage since 2008. As short-term measure to avoid recurrence of breaches in Kosi Barrage, the KHLC inspects the existing works on Kosi river every year and suggests necessary restoration works for implementation by the Government of Bihar. As long-

term measures, five Multipurpose projects in Nepal are under various stages of finalization/studies. The Committee also note the submission of the Government that unless construction of reservoirs, i.e. high dams in the upstream of these rivers, is taken up, the flood problem cannot be solved fully. Noting that the short-term measure of flood protection works carried out by KHLC have been ineffective to solve flood problem, the Committee feel that the focus should be on long-term measures for flood control in respect of Kosi river. The Committee also note that the tenure of JPO-SKSKI has been fixed upto February, 2015 for completing field investigations and preparation of DPRs for Sapta Kosi High Dam Multipurpose project and Sun Kosi Storage-cum-Diversion scheme at a revised cost of Rs.104.78 crore. The Committee desire to see the works pertaining to field investigations and preparation of these DPRs completed within the scheduled time without involving any further revision of cost so that the process for execution of these two projects be taken up in the near future. The Committee would like to be apprised of further action taken in this regard.

NEW DELHI;
18 February, 2014
29 Magha, 1935 (Saka)

DIP GOGOI
Chairman,
Standing Committee on Water Resources

PART-III

MINUTES

MINUTES OF THE SIXTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2008-2009) HELD ON FRIDAY, 21 NOVEMBER 2008

The Committee sat from 1500 hours to 1610 hours in Committee Room 'D', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri R. Sambasiva Rao – Chairman

MEMBERS

LOK SABHA

2. Shri Bhanwar Singh Dangawas
3. Shri Bikram Keshari Deo
4. Shri Rajen Gohain
5. Smt. Preneet Kaur
6. Shri Shankhlal Majhi
7. Shri Abu Ayes Mondal
8. Shri Harilal Madhavaji Bhai Patel
9. Dr. Arun Kumar Sarma
10. Shri Anurag Singh Thakur

RAJYA SABHA

11. Shri Kumar Deepak Das
12. Shri K.E. Ismail
13. Prof. P.J. Kurien

SECRETARIAT

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| 1. | Shri N.K. Sapra | - | Additional Secretary |
| 2. | Shri P.V.L.N. Murthy | - | Deputy Secretary |

REPRESENTATIVES OF MINISTRY OF WATER RESOURCES

1. Shri U.N. Panjiar, Secretary (WR)
2. Shri S. Manoharan, Additional Secretary (WR)
3. Shri R.C. Jha, Chairman, Ganga Flood Control Commission
4. Shri S.P. Kakran, Commissioner (Ganga)

At the outset, the Hon'ble Chairman welcomed the members to the sitting of the Standing Committee on Water Resources.

2. Thereafter, the representatives of the Ministry of Water Resources were called in and the Hon'ble Chairman welcomed the Secretary, Ministry of Water Resources and his colleagues to the sitting of the Committee and requested them to introduce themselves to the Committee.

3. After the introduction, the Commissioner (Ganga), Ministry of Water Resources gave a brief power point presentation on different aspects of Working of the 'Ganga Flood Control Commission'. Thereafter, the Hon'ble Chairman and the members of the Committee sought certain clarifications on various aspects of the subject from the representatives of the Ministry of Water Resources. The representatives of the Ministry responded to the queries raised by members.

4. A verbatim record of the proceedings of the sitting of the Committee has been kept.

The Committee then adjourned.

**MINUTES OF THE FIFTEENTH SITTING OF THE STANDING COMMITTEE ON WATER
RESOURCES (2009-2010) HELD ON WEDNESDAY, 14 JULY 2010**

The Committee sat from 1430 hours to 1545 hours in Committee Room No. 53, First Floor,
Parliament House, New Delhi.

PRESENT

Shri Beni Prasad Verma – Chairman

MEMBERS

LOK SABHA

11. Shri Ghanshyam Anuragi
12. Shri Mahendrasinh P. Chauhan
13. Shri Sher Singh Ghubaya
14. Shri Badri Ram Jakhar
15. Shri Virender Kashyap
16. Shri Ramashankar Rajbhar
17. Shri K.J.S.P. Reddy
18. Shri K.R.G. Reddy
19. Shri S.P.Y. Reddy
20. Shri Arjun Roy
21. Smt. Annu Tandon
13. Dr. P. Venugopal (Tiruvallur)
14. Shri Sajjan Verma

RAJYA SABHA

15. Shri Kumar Deepak Das
16. Dr. Ashok S. Ganguly

SECRETARIAT

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| 1. | Shri N.K. Sapra | - | Additional Secretary |
| 2. | Shri Devender Singh | - | Joint Secretary |
| 3. | Shri B.S. Dahiya | - | Director |

REPRESENTATIVES OF THE GANGA FLOOD CONTROL COMMISSION

1. Shri A.K. Ganju, Chairman
2. Shri M.U. Ghani, Member
3. Shri S.M. Husain, Member

At the outset, the Chairman welcomed the Members of the Committee and the representatives of the Ganga Flood Control Commission (GFCC) to the sitting of the Committee convened to have first hand knowledge on the subject, "Ganga Flood Control Commission".

2. After the introduction, the Chairman, Ganga Flood Control Commission gave an overview of the working of the Ganga Flood Control Commission. The Members then sought clarifications on various issues relating to the subject which were replied to by the representatives of the GFCC.

3. The following main issues and concerns were addressed, among others, during the sitting:

- (i) the schemes drawn by the GFCC for flood and erosion control;
- (ii) the need for water conservation;
- (iii) the need for construction of dams and reservoirs to check recurring floods; and
- (iv) the strengthening of the Ghagra, Rapti, Bhagmati rivers banks, etc.

4. The Chairman then thanked the representatives of GFCC for their free and frank replies to the queries of the Members.

(The witnesses then withdrew)

5. The Committee then decided to hold another sitting for detailed examination of the subject.

The Committee then adjourned.

**MINUTES OF THE TWELFTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES
(2011-2012) HELD ON FRIDAY, 20 JULY 2012**

The Committee sat from 1500 hours to 1645 hours in Committee Room 'E', Basement, Parliament House Annexe, New Delhi.

PRESENT

Shri Dip Gogoi – Chairman

MEMBERS

LOK SABHA

2. Shri Badri Ram Jakhar
3. Shri Haribhau Jawale
4. Shri Virender Kashyap
5. Shri Mahendrasinh P. Chauhan
6. Shri Mangani Lal Manal
7. Shri Nityananda Pradhan
8. Shri K.J.S.P. Reddy
9. Shri K.R.G. Reddy
10. Shri S.P.Y. Reddy
11. Shri Arjun Roy
12. Shri Jagadanand Singh
13. Shri Murarilal Singh
14. Shri N. Chaluvarya Swamy
15. Smt. Annu Tandon
16. Dr. P. Venugopal

RAJYA SABHA

17. Shri Balwinder Singh Bhunder
18. Smt. Vandana Chavan
19. Shri Anil Madhav Dave
20. Shri Kumar Deepak Das
21. Shri B.S. Gnanadesikan
22. Shri Rama Chandra Khuntia
23. Shri Mangala Kisan
24. Dr. Gyan Prakash Pilonia
25. Smt. Bimla Kashyap Sood

SECRETARIAT

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| 1. | Shri Devender Singh | - | Joint Secretary |
| 2. | Smt. Rita Jailkhani | - | Additional Director |

REPRESENTATIVES OF THE MINISTRY OF WATER RESOURCES

1. Shri G. Mohan Kumar, Additional Secretary (WR), MoWR
2. Shri R.C. Jha, Chairman, Central Water Commission
3. Shri Bibhash Kumar, Chairman, GFCC

At the outset, the Chairman welcomed the representatives of the Ministry of Water Resources, Central Water Commission and Ganga Flood Control Commission to the sitting of the Committee convened for briefing the Members on "Ganga Flood Control Commission".

2. After the introduction, the Chairman, GFCC gave a power point presentation on the subject.

The Members raised the following issues and concerns :

- (i) Need to keep data of peak discharge rate of Ganga on yearly, monthly and daily basis at Patna;
- (ii) Need for close coordination among the Ganga Flood Control Board, the Ganga Flood Control Commission, and the Ministry of Water Resources;
- (iii) Need for sustained bilateral discussion with a view to taming the Kosi river;
- (iv) Need by Ganga Flood Control Commission to hold regular meetings;
- (v) Need to control the discharge of water to control floods;
- (vi) Need for better coordination with the State Governments to control floods;
- (vii) Need to take steps to control soil erosion which can damage the agricultural land and steps to improve catchments areas for better water flow;
- (viii) Protection and compensation of people living in embankment areas of flood-prone rivers;
- (ix) Need to construct flush gates in the dams.
- (x) Need to take proactive steps in controlling floods;
- (xi) Need to focus on the human vulnerability of flood, i.e. number of deaths, displacement, losses of property, animal, etc;

- (xii) Need by Ganga Flood Control Board to focus on climate change, specially the melting of glaciers and also a disaster management to tackle flood situations such as in Kosi river;

3. The Committee asked the representative of the Ministry of Water Resources to furnish written replies to queries raised by the Members which could not be replied.

The witnesses then withdrew.

4. A copy of the verbatim proceedings of the sitting was kept for record.

The Committee then adjourned.

**MINUTES OF THE SECOND SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES
(2013-2014) HELD ON FRIDAY, 18 OCTOBER 2013**

The Committee sat from 1130 hours to 1300 hours in Room No.53, First Floor, Parliament House, New Delhi.

PRESENT

Shri Dip Gogoi – Chairman

MEMBERS

LOK SABHA

2. Shri Kameshwar Baitha
3. Dr. Mahendrasinh P. Chauhan
4. Shri Badri Ram Jakhar
5. Shri Haribhau Jawale
6. Shri Mangani Lal Mandal
7. Shri Abhijit Mukherjee
8. Shri Arjun Ray
9. Shri S.P.Y. Reddy
10. Dr. P. Venugopal
11. Shri Sajjan Verma

RAJYA SABHA

12. Shri Balwinder Singh Bhunder
13. Dr. Gyan Prakash Pilania
14. Shri Palvai Govardhan Reddy
15. Shri A.V. Swamy

SECRETARIAT

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| 1. | Shri Devender Singh | - | Joint Secretary |
| 2. | Shri Pawan Kumar | - | Director |
| 3. | Smt. Rita Jaikhani | - | Additional Director |

**REPRESENTATIVES OF THE MINISTRY OF WATER RESOURCES, GANGA FLOOD CONTROL
COMMISSION AND CENTRAL WATER COMMISSION**

1. Shri Alok Rawat, Secretary
2. Smt. Urvilla Khatri, JS(PP)
3. Shri Pradeep Kumar, Commissioner (SP)
4. Shri Bibhas Kumar, Chairman, GFCC
5. Shri A.B. Pandya, Member (D&R), CWC
6. Shri Devender Sharma, Member (RM), CWC

At the outset, the Chairman welcomed the representatives of the Ministry of Water Resources, Ganga Flood Control Commission and Central Water Commission to the sitting of the Committee convened to have evidence of the representatives of the Ministry of Water Resources in connection with the examination of the subject "Review of Ganga Flood Control Commission".

2. After the introduction, the representatives of Ministry of Water Resources gave power-point presentation on 'Review of Ganga Flood Control Commission. The Members sought clarifications on various issues relating to the role, performance and functions of the Ganga Flood Control Commission. The major issues raised and discussed during the sitting of the Committee included the following :

- (i) Measures taken by Central Water Commission, Ministry of Water Resources to control floods in the aftermath of cyclone Phailin which struck Odisha coast recently;
- (ii) Flood Management Works and funding norms in Ganga basin;
- (iii) Storage capacity of the Ganga and its tributaries.
- (iv) Total volume of water discharge which goes waste being arrested and utilised before flowing into the sea; plans for creation of reservoirs under the programme of Inter-Linking of Rivers to control the water that goes into the sea;
- (v) Average annual rainfall, total cropped area; flood prone area and flood protected area in the Ganga basin vis-à-vis in the whole country;
- (vi) Separation of data on flood prone areas in the States of Bihar and Jharkhand;
- (vii) Inter-Linking of Rivers with reference to the Himalayan Component of the rivers; and
- (viii) Problem of flood in Farakka Barrage area due to non maintenance of embankments etc.

3. The Committee asked the Secretary, Ministry of Water Resources to furnish written replies within a fortnight to queries raised by the Members during the sitting which could not be replied orally and also submit action taken note on the assurances given to the Committee during evidence.

The witnesses then withdrew.

4. A copy of the verbatim proceedings of the sitting was kept for record.

The Committee then adjourned.

**MINUTES OF THE SIXTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES
(2013-2014) HELD ON TUESDAY, 18 FEBRUARY 2014**

The Committee sat from 1500 hours to 1530 hours in Chairman's Chamber (Room No.129),
First Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Dip Gogoi – Chairman

MEMBERS

LOK SABHA

2. Shri Abhijit Mukherjee
3. Shri D.K. Suresh

RAJYA SABHA

4. Shri Balwinder Singh Bhunder
5. Smt. Vandana Chavan
6. Dr. Ashok S. Ganguly
7. Dr. Gyan Prakash Pilonia
8. Shri Palvai Govardhan Reddy
9. Shri A.V. Swamy
10. Smt. Wansuk Syiem

SECRETARIAT

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| 1. | Shri Devender Singh | - | Joint Secretary |
| 2. | Shri Pawan Kumar | - | Director |
| 3. | Smt. Rita Jailkhani | - | Additional Director |

At the outset, the Chairman welcomed the Members to the sitting of the Committee convened for consideration and adoption of draft Report on the subject "Review of Ganga Flood Control Commission".

2. Thereafter, the Committee took up the draft Report for consideration. After some discussion, the Committee adopted the Report without any modifications/amendments.

3. The Committee then authorized the Chairman to finalise the report in the light of verbal and consequential changes arising out of factual verification by the Ministry and to present the Report to both the Houses of Parliament.

The Committee then adjourned