GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES

RESTRUCTURING OF CENTRAL WATER COMMISSION

(Volume: II)

New Delhi
May, 2011

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Chapter - 1

OVERVIEW OF WATER SECTOR OF INDIA

1.1 Water Resources Availability

Only a few countries in the globe can boast of such an extensive river network that our country has. The mighty Indus-Ganga-Brahmaputra in the North, the Narmada-Tapi-Mahanadi in the Central region and Godavari-Krishna-Cauvery in the South have been symbols of existence and growth of our country right from its inception.

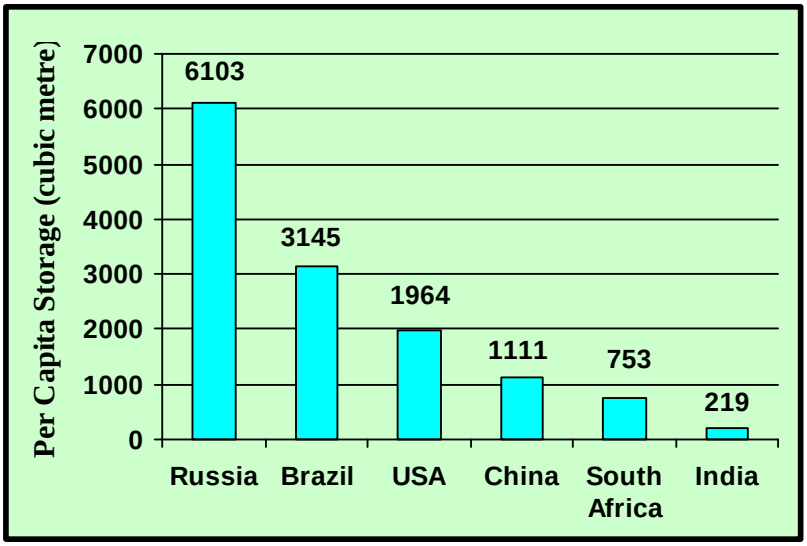
Although India has to support 17% of world's population, it has only 2.4% of land and 4% of water resources of the world. The total precipitation including snowfall, in the country is around 4000 Billion Cubic Metre (BCM), about 75% of which is confined to only about 3-4 months of the year accounting for a significantly high temporal variation. The spatial variability is also evident from the fact that while on one hand rainfall is of the order of 10,000 mm at Mausynram in Meghalaya, it is merely 100 mm in the western parts of Rajasthan. The average annual water resources potential is about 1869 BCM. Because of topographical and other constraints, 690 BCM from surface water and 433 BCM from ground water can be put to beneficial use.

1.2 Water Resources Development – Present Scenario

1.2.1 Creation of Surface Storage

Water resources development which received high priority in the successive five year plans initiated after independence has resulted in many achievements that are discernible. Many major, medium and minor water resources projects have been constructed during the past six decades. There are about 5000 completed large dams and another 475 are under various stages of constructions. All these projects have resulted in increase in the live storage capacity from 15.6 BCM at the time of independence to 225 BCM now. Storages held in these dams are an insurance against the vagaries of weather. Projects under construction are likely to add another 64 BCM while 108 BCM is expected to be contributed by the projects under consideration. India ranks much below in the World after Russia, Brazil, USA, China and South Africa in terms of per capita storage as shown in the Fig.-1.1.

Fig.-1.1 Per Capita Storage



1.2.2 Development in Irrigation Sector

The total investment in irrigation sector during the plan period is of the order of Rs.4500 billion (tentative upto XI Plan). As a result of this, irrigation potential created has gone upto approximately 108 million hectare (mha) against 22.6 mha in 1951. The ultimate irrigation potential is 139.90 mha. It is estimated that the expansion of irrigation systems alone has contributed to about 52% increase in food grains production.

India's success story in the agricultural sector largely owes to the number of major, medium and ERM projects implemented/ initiated during the successive plan periods as shown in the Table-1.1 below:

Table-1.1 Major, Medium & ERM projects in India

	Major	Medium	ERM	Total
Completed	186	813	121	**1120**
Ongoing	182	273	98	**553**
Total	**368**	**1086**	**219**	**1673**

Irrigation through ground water has been achieved, mainly through construction of around 10 million dug wells / shallow tube wells.

1.2.3 Hydropower Development

India is endowed with estimated hydropower potential of 150,000 MW. The total hydropower developed, so far, is 37,400 MW which is 25% of the country's hydropower potential. The share of hydropower in the overall energy

mix has been declining over the years. Against an ideal hydroelectric-thermal mix of 40:60 it presently stands at 25:75. Due to this the peaking deficits are high. In order to remedy this situation by expediting systematic hydropower development, an initiative of adding 50,000 MW has been taken up.

A Large number of dams and Hydropower plants have been set-up and many more are under planning and construction. Dam safety requirement and instrumentation in Dams and Power House Caverns, other hydraulic structures, special Analysis like Dam Break Modeling and foundation problems, etc. needs greater attention and concerted efforts with many of them coming up in difficult sites and geologically fragile Himalayan region.

1.2.4 Industrial & Other Uses

Water requirement for industries in India, is quite small compared to the quantity of water needed in agriculture. Only about 5% of present water use is for industrial purposes. The requirement of water for industrial use and for other uses such as navigation, ecological recreation, etc., though not so significant in terms of consumptive use, will continue to be important and will have specific quantity and temporal needs.

1.2.5 Present Water Utilization & Future Demand

The present water utilization and the probable trend for future water requirement for various sectors, as assessed is shown in the Table-1.2 below:

Table-1.2 Sector-wise Water Utilization and Future Demands

Sector	Year 2010	Year 2025		Year 2050	
	High	Low	High	Low	High
Irrigation	557	561	611	628	807
Domestic	43	55	62	90	111
Industries	37	67	67	81	81
Power	19	31	33	63	70
Inland Navigation	7	10	10	15	15
Flood Control	0	0	0	0	0
Environment(1) Afforestation	0	0	0	0	0
Env.(2)Ecology	5	10	10	20	20
Evaporation losses	42	50	50	76	76
Total	**710**	**784**	**843**	**973**	**1180**

(Ref: National Commission on Integrated Water Resources Development (NCIWRD) (1999) for high and low demand scenarios)

Chapter - 2

EMERGING ISSUES AND CHALLENGES IN INDIA'S WATER SECTOR

2.1 Issues and Challenges in the Water Sector

The pressure on our water & land resources is continuously increasing with the rise in population, urbanization and industrialization and threat of adverse impacts of climate change. Consequently, a number of issues have cropped up in water sector which call for timely and effective redressal. A macro level perspective of the issues and challenges is listed as below:

- Food security including water security;
- Poverty reduction and economic growth;
- Declining per capita availability of water;
- Lack of coordination among planners at one hand and stakeholders at other hand;
- Inadequate thrust to integrated water resources development and management;
- Rise in Water related conflicts, crisis of water governance;
- National perspective overlooked by the States;
- Climate change preparedness;
- Dam Safety Requirement and Regulations Bill;

Some of the issues and other relevant challenges are discussed briefly in following paragraphs:

2.1.1 Spatial and Temporal Variation in Water Availability

The spatial unevenness and temporal variation in precipitation has led to complex situations like the distinctly different monsoon and non-monsoon seasons, the high and low rainfall areas and the drought-flood-drought syndrome. Therefore, storage capacity in the country needs to be increased.

2.1.2 Declining per Capita Water Availability

Though from the point-of-view of the National level scenario, India may be above the internationally accepted standards of water scarcity (1000 m^3 per capita per year) , yet the figures at the basin level vary widely from 13636 m^3 per capita per year in Brahmaputra-Barak basin to 298 m^3 per capita per year in Sabarmati basin. The situation is projected to get even more serious in

2050 when, about 22% of the area and 17% of the population in the country may be under absolute scarcity condition. Taking into consideration the projections of the population for the year 2025 and 2050, the average annual per capita availability of water is estimated to be 1340 and 1140 cubic metre respectively. Thus, there is seriously decreasing trend in the per capita water availability due to increase in population, urbanization and industrialization which needs to be addressed.

2.1.3 Low Water Use Efficiency

The water use efficiency in irrigation sector in our country is of the order of only 25% to 35% in most irrigation system, with efficiency of 40% to 45% in a few exceptional cases. Some of the prime reasons for low irrigation efficiency are completion of dam/ head works ahead of canals, dilapidated irrigation systems, unlined canal systems, lack of field channels, lack of canal communication network, lack of field drainage, improper field leveling etc. This needs to be improved.

2.1.4 Flood Management

Many areas of the country frequently suffer from floods which cause substantial damage. Because of varying rainfall distribution, many a times, areas which are not prone to floods also experience severe inundation. The area prone to the floods in the country has been assessed to be of the order of about 46 Mha. Flood control measures mostly in the form of flood embankments have been undertaken and about 18.22 Mha of flood prone area have been protected. However, lot more work in this area needs to be undertaken.

2.1.5 Over-exploitation of Ground Water Resources

Rapid pace of ground water development has resulted in a number of problems. In many arid and hard rock areas, overdraft and associated water quality problems are increasing. In addition to problems caused due to human interference, natural factors like occurrence of high content of fluoride, arsenic and iron are also affecting the ground water quality in several parts of the country.

2.1.6 Water Related Issues with Neighbouring countries

Issues with the neighbouring countries including with Bangladesh, Nepal, Pakistan, China and Bhutan are increasing day-by-day. There are varieties of

matters like flood management with Nepal, Bangladesh and China; water sharing mainly with Bangladesh; implementation of Indus Water Treaty in right spirit with Pakistan; water resources development with Nepal and Bhutan etc. All such issues are ever increasing; need consistent and in-depth analysis of the data and available information and policy formulation in order to maximize national interests.

2.1.7 Other issues

Apart from above, there are also governance issues like addressing the growing conflicts amongst the users of various sectors as also different regions, lack of co-ordination among the agencies involved in water sector; policy issue like need of shifting from project specific planning to integrated approach with basin or sub-basin as a unit; and administrative issues like problems of land acquisition and Environment & Forests clearance of projects.

2.2 Climate Change

This is the most important emerging challenge at hand. India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change. Climate change may alter the distribution and quality of India's natural resources and adversely affect the livelihood of its people. With an economy closely tied to its natural resource base and climate-sensitive sectors such as agriculture, water and forestry, India may face a major threat because of the projected changes in climate.

Considering the likely impacts GoI has formulated National Action Plan for Climate Change wherein eight missions have been conceptualized. National Water Mission is one of the eight missions for understanding the impacts of climate change on water resources and accordingly plan adaptation measures.

2.3 Dam Safety Regulation

In India, there are 4711 large dams completed and another 390 dams are under construction (as per National Register of Large Dams, 2009 published by CWC). These dams have served the country well for the economic stability even in the worst years of drought, floods, cyclones, etc. Out of these, 3750 (79.6%) dams are more than 20 years old. Many large dams are ageing and have various structural deficiencies and shortcomings in operation and monitoring facilities. Few of them do not meet the present design standards –

both structurally and hydrologically. Thus an increasing number of dams fall in the category where they need rehabilitation.

CWC is actively involved in Monitoring of Dam Safety and Rehabilitation aspect of large dams, Instrumentation in Dams and Power House Caverns, other hydraulic structures, special Analysis like Dam Break Modeling and foundation problems, Computer Aided Design, etc.

The following functions related to Dam Safety aspects need to be strengthened:

- Dam safety reviews and MIS for Dams including Dam registers- online databases
- Technology acquisitions and dissemination on Dam safety to State Govts / Organisations
- Dam break studies, glacial break studies and preparation of emergency Action Plans
- Analysis of structural behavior of Dams with special reference to implemented instrumentation systems in the dams
- Monitoring implementation of Dam Safety Legislation
- Technology upgradation for rehabilitation of distressed dams in efficient manner.

Chapter - 3

WAY FORWARD

3.1 Introduction

There is urgent need for addressing the stated issues and challenges in India's water sector (Chapter - 2) effectively. The way forward for addressing the issues effectively has been reiterated by various committees and experts and also emphasised in the policy guidelines as enumerated below:

- Development, conservation, utilisation and management of water resource in sustainable manner, have to be guided from national perspective – NWP-2002.
- Need for holistic planning & development of water resources considering river basin as unit has become unavoidable.
- Expansion of hydrological network and to develop protocols for data collection from other agencies.
- Need to take up activities to address climate change issues appropriately.
- Increased Central assistance to Projects as per basin plan.
- Improvement in water use efficiency including in operation and management of projects.
- Capacity building.

National Water Policy 2002 - Highlights

The National Water Policy, 2002 highlighted water as a scarce and precious national resource to be planned, developed, conserved and managed as such, and on an integrated and environmentally sound basis, keeping in view the socio-economic aspects and needs of the states.

Some of the salient points of the Policy are:

- *Water resources development and management will have to be planned for a hydrological unit such as drainage basin as a whole or for a sub-basin, multi-sectorally, taking into account surface and ground water for sustainable use incorporating quantity and quality aspects as well as environmental considerations*.
- *Appropriate River Basin Organisations should be established for the planned development and management of a river basin as a whole.*

- *There should be an integrated and multi-disciplinary approach to the planning, formulation, clearance and implementation of projects, including catchment area treatment and management, environment and ecological aspects, the rehabilitation of affected people and command area development*.
- *In respect of flood control and management, there should be a master plan for each flood prone basin.*
- *A standardized national information system should be established with a network of data banks and data bases, integrating and strengthening the existing central and state level agencies and improving the quality of data and the processing capabilities*.

3.2 Adopting River Basin Approach for Integrated Water Resources Development and Management

Water resource development is to be seen not merely as a single-sector-end objective, but as a prime mover in developing larger systems with multiple linkages. Therefore, the project-centric development that was aggressively pursued during the early-plan periods needs to be replaced by integrated water resources development and management approach that is better suited under the present circumstances for optimizing the water resources allocation among competing multi-sectoral water demand/uses. This integration has to be a multi-disciplinary approach which would take care of all the conflicting issues and deliver solutions that would be technically feasible, economically viable, socially acceptable and ecologically & environmentally sound.

3.2.1 Formulation of River Basin Plan

The formulation of river basin plan is highly interactive, consultative, data intensive analysis, what-if scenario generation, and ongoing process involving the broad steps as pointed below:

- Assessment of data requirement.
- Assessment of current sector-wise water utilization upto possible small scale (preferably watershed).
- Assessment for the future requirements for various uses and basin specific issues and needs.
- Priorities of the States in future utilization.
- Formulation of draft Plan Document.

- Discussion with stakeholders.
- Review of the Plan. (Iterative process).

3.2.2 Data Requirement for Preparation of River Basin Plan

The data requirement is huge and an indicative list has been provided as following:

- Topographical data;
- Hydrological data;
- Meteorological data;
- Water quality & pollution data;
- Land use-land cover data;
- Agricultural, Irrigation and soil data;
- Demographic data;
- Socio-economic including religious & recreation related data;
- Water projects, Industries and local development plans;
- Power demand data;
- Flood, Drought, other Natural disaster and seismic data; and
- Communication including navigation data

3.3 Goals of National Water Mission (NWM)

Government of India has approved the National Water Mission under its overall programme of National Action Plan for Climate Change. The National Water Mission has identified five goals under which various activities related to water management issues are to be taken up arising out of climate change. The five goals are as under:

1. Comprehensive water data base in public domain and assessment of the impact of climate change on water resources;
2. Promotion of citizen and State actions for water conservation, augmentation and preservation;
3. Focused attention on vulnerable areas including over-exploited areas;
4. Increasing efficiency by 20%; and
5. Promotion of basin level integrated water resources management.

The NWM has identified various strategies to achieve the above mentioned goals. Activities have also been identified under those strategies. Some of the strategies and activities under various Goals particularly pertaining to CWC are discussed in the following paragraphs.

3.4 Role of CWC in Implementation of NWM

As an apex technical organization in water sector in the country and as a technical arm of the Ministry of Water Resources, CWC has primary role in implementation of NWM. It has to shoulder the major responsibility of initiating, coordinating and furthering the various activities envisaged under identified strategies so that the enshrined goals of NWM are achieved in time.

New activities required to be taken by CWC to fulfill Goals of NWM

- Preparation of basin wise integrated water resources development and management plans
- Ensuring convergence among various water resources programmes - CAD&WM, RRR of Water Bodies, Ground water recharge, NREGA, Drinking water supply, Integrated watershed development programme, etc.
- Research work in various aspects to be taken up/guided through research agencies and academic institutes (Climate change, Water Use efficiency, etc.)
- Field setup of CWC to engage in encouraging PIM through CAD & WM and promote participation of NGOs.
- CWC to prepare guidelines and incentivize the use of efficient irrigation practices
- Dam Safety monitoring

Activities of CWC required to be expanded to fulfill Goals of NWM

- Hydrological Network for collection of additional necessary data to be increased 4 to 6 fold varying from basin to basin.
- Expansion of Flood (level and Inflow) forecasting network.
- Development and updation/ validation of Water Resources Information System (WRIS).
- Strengthen appraisal, monitoring and finance related services for water resources projects & flood management schemes at field level.
- Dam break analysis and disaster management plans.

Chapter - 4

CENTRAL WATER COMMISSION - NEED FOR RESTRUCTURING

4.1 Introduction

Central Water Commission (CWC), an apex organization in the country in the field of Water Resources came into existence in the year 1945 as “Central Waterways, Irrigation and Navigation Commission”. In the year 1951, it was renamed as “Central Water and Power Commission” (CW&PC) after its merger with the “Central Electricity Commission”. Following the changes in the Ministry of Agriculture and Irrigation, in the year 1974, water wing of CW&PC was separated as “Central Water Commission”, which continues till date. At present Central Water Commission functions as an “Attached Office” of the Ministry of Water Resources and is its main technical arm. A brief chronology of evolution of Central Water Commission is given at **Annex-I.**

It may be seen that during the course of institutional changes and increased emphasis on Water Resources Development and Management, the CWC has evolved into a body of expertise in various facets of Development and Management of Water Resources. It serves as a specialized organisation providing adequate back up support to the Center as well as the States in the above areas.

The Central Water Commission occupies a central position in the water resources scenario in the country, performing a wide range of activities including hydrological observations on all the important rivers, flood forecasting, preparation and appraisal of water development projects in the country including survey and investigation assistance wherever requested by the state governments and supportive guidance in the areas of Design and Research.

As the technical arm of the GOI in the water resources sector, CWC has built up valuable expertise in water resources development and management, despite the subject being constitutionally listed as the concern of state governments. CWC is charged with the general responsibility of initiating, coordinating and furthering in consultation with the State Governments concerned, schemes for the control, conservation and utilization of water resources in the respective state for the purpose of flood management, irrigation, drinking water supply and water power generation. The Commission, if so required, can undertake the construction and execution of

any such scheme. The present role of CWC has been broadly listed out at **Annex-II**.

A big and broad picture of the country's water resources scenario comes naturally to CWC, a strength that is critical to policy making and is unique to the Commission. The strength comes from the wide exposure to almost all the major water resource development initiatives and projects across the country and interaction with other national and international agencies and committees that are involved in multifarious activities for the development of water resources. The presence of an organized cadre of Central Water Engineering Service and other supporting cadres have contributed greatly to the ability of CWC to present the national picture of water resource management.

4.2 Mission Statement of CWC

CWC functions with the Mission

"**To promote integrated and sustainable development and management of India's water resources by using state-of-the-art technology and competency in coordination with all stakeholders"**.

Core values of CWC are:

- The excellent technical expertise and competence of the officers built up over the years of experience in tackling various problems in the field of water resource development,
- Neutrality and fairness in dealing with inter-state water resource development,
- Transparency in processing information and data received from states,
- Accuracy in collection/ analysis of hydrological data,
- Continuous improvement in knowledge and performance.

4.3 Present Organisational Structure at Head Quarter

Central Water Commission is headed by a Chairman, with the status of an Ex-Officio Secretary to the Government of India. The work of the Commission is divided among 3 wings namely, Designs and Research Wing (D&R), Water Planning and Projects Wing (WP&P) and River Management Wing (RM). Allied functions are grouped under respective wings and each wing is placed under the charge of a full-time Member with the status of an Ex-Officio Additional Secretary to the Government of India. Each wing comprises of a number of Units/ Organizations (headed by the officers of the rank of Chief

Engineer), and is responsible for the disposal of tasks and duties falling within the scope of functions assigned to it. In the discharge of these responsibilities, the Members are assisted by officers of the rank of Chief Engineer, Director/Superintending Engineer, Deputy Director/Executive Engineer, Assistant Director/Assistant Executive Engineer and other Engineering and Non-Engineering officers and supporting staff. There is a separate Human Resources Management Unit headed by a Chief Engineer, to deal with Human Resources Management & Development, Financial Management, Training and Administrative matters of the Central Water Commission.

4.4 Present Organisational Structure at Regional Offices

In order to achieve better management in the Water Resources Sector and have better coordination with the State Government departments, CWC has established 13 regional offices, each headed by a Chief Engineer. The offices are located at Bangalore, Bhopal, Bhubaneswar, Chandigarh, Coimbatore, Delhi, Hyderabad, Lucknow, Nagpur, Patna, Shillong, Siliguri and Gandhi Nagar.

National Water Academy, the training institute of CWC, is located at Pune for training of Central and State in-service engineers and functions directly under the guidance of the Chairman.

4.5 Present strength of all Group A posts

The present strength of all Group A posts in CWC is given in **Annex-III**.

4.6 Central Water Engineering Group 'A' Service

Central Water Engineering Group 'A' Service (CWES-Gr'A') is one of the organised Central Engineering Services of the country. This is the only organized service which is dealing with all the aspects of the water resources development and management in the country at Central level. The CWES-Gr'A' was formally constituted as an organised service in the year 1965, though the cadre had been building since 1945. This service was mainly constituted with the objective of efficiently manning the various formations of the Government of India (GoI) dealing with water resources development.

The method of recruitment to the various posts of CWES-Gr'A' is regulated by the Central Water Engineering (Group 'A') Service Rules, 2004. Majority of

Group ‘A’ posts in Central Water Commission (about 87%) are manned by CWES officers.

The CWES officers also man the en-cadered engineering posts in Ministry of Water Resources, Central Electricity Authority, Ganga Flood Control Commission, Sardar Sarovar Construction Advisory Committee and Farakka Barrage Project. The CWES officers on deputation also man senior level posts in Brahmaputra Board, Narmada Control Authority, National Water Development Authority, WAPCOS, NIH and other technical organizations under MOWR. CWES is thus, the main source of technical manpower of MOWR and the only organised Gr. 'A' service of MOWR.

The existing cadre structure of CWES-Gr‘A’ after the latest Cadre Review (third) is indicated in Table-3.1.

Table-3.1 Existing Cadre Structure of CWES-Gr‘A’

Name of Post	MoWR	CWC	CEA	GFCC	SSCAC	FBP	Total
Chairman	-	1	-	-	-	-	1
Member (CWC) / Chairman (GFCC)	-	3	-	1	-	-	4
SAG	5	31	1	2	1	1	41
JAG	17	139	3	4	1	4	168
STS*	7	222	9	8	3	-	249
JTS	2	238**	14	8	-	-	262
Total	**31**	**634**	**27**	**23**	**5**	**5**	**725**

* 30% of total senior duty posts are in Non-Functional Selection Grade.
** This includes 22 posts for Deputation reserve, 22 posts for leave reserve and 6 posts for training reserve.

Apart from manning the aforesaid organisations, the CWES officers have also been called upon to handle major jobs of planning, design, construction and monitoring of several important Water Resources and Power Projects in India and abroad. Water & Power Consultancy Services (India) Ltd. (WAPCOS) have been drawing upon the vast and varied expertise available in the Service for providing consultancy to various developing countries like Afghanistan, Bhutan, Burma, Indonesia, Iraq, Nigeria, Philippines, Vietnam etc.

CWES has thus come to acquire a distinct and distinguished position as a truly competent engineering force of able and dedicated Water Resources Development Experts.

4.7 Recommendation for restructuring of CWC by various bodies in past

Emerging issues and challenges in the water have been examined in detail by various committees, expert bodies etc. and recommendations have been given from time to time on the need for change in role of CWC. Some of these are discussed as below:

Recommendations of Hashim Commission

The National Commission for Integrated Water Resources Development Plan (NCIWRDP), set up by the Government of India under the chairmanship of Dr. S.R. Hashim, Member, Planning Commission, in its report of September, 1999, had inter-alia opined as under:

- *Need has been felt to have a statutory apex body at the Central level which could be entrusted with the responsibility of collection, analysis and dissemination of data, preparation of guidelines for integrated development and management plans, monitoring the implementation of schemes and principles of sharing water in the inter-state rivers. In our opinion, the Central Water Commission could be restructured and made to shoulder this responsibility after making it a statutory body. The restructured CWC besides performing the above functions could also prescribe technical standards for the designs, approve the major schemes for implementation and assist the River Basin Organisations (RBOs) to evolve agreements/consensus between the states in respect of matters pertaining to inter-basin transfers and pollution control.*

- *CWC should be restructured into a statutory high powered inter-disciplinary Commission, with maximum autonomy, in order to deal with policy and reforms, centre-state and inter-state issues, planning and project finalization, international aspects other than those that have to be retained with the ministry; legal, economic and financial issues, water productivity, conservation and management, environmental aspects and rehabilitation, people's participation and communication, coordination and facilitation of inter-disciplinary research, HRD and training and a National Information/Data System. This responsibilities will be fulfilled by organizing the work of the Commission in major Divisions, which be headed not by engineers alone, but also by senior professional in respective fields with expertise in water sector. The Commission should have powers to establish innovative organizational structures for specific functions, say, for example, designs, which is a very important activity.*

- *The Chairman, CWC should actually function as a Secretary to Government in the Ministry in respect of certain delineated responsibilities. We suggest that the entire question of restructuring of the CWC may be got studied in detail, by appointing competent consultants.*

Implementation Cell of Ministry of Water Resources

The recommendations of Hashim Commission pertaining to CWC were considered by the Implementation Cell of the Ministry of Water Resources and it was suggested that CWC should be restructured as a Statutory High Powered Interdisciplinary Commission with maximum autonomy. The organizational structure as suggested by the Cell was with a Chairman and 8 full time Members namely, Designs & Research, Water Planning, Planning and Progress, Inter-State Matters, River Management (North and West), River Management (East and South), Environment and Economics and 5 part time members namely, Director General, National Water Development Agency, Chairman, Central Ground Water Board, Director General, India Meteorological Department, Member (Hydro), Central Electricity Authority and Additional Secretary, Ministry of Agriculture.

Recommendations of Administrative Staff College of India

The MoWR appointed the Administrative Staff College of India (ASCI), Hyderabad in September, 2001, as consultants to carry out the study on restructuring of CWC. The terms of reference of the study assigned to ASCI envisaged analysis of the current role of CWC in the water resources sector within the frame work of Central Government responsibilities as defined by the Constitution of India. It also required ASCI to suggest changes in the scope of activities, organizational nature and structure and new competencies that CWC would need in the context of long term changes that the organization is expected to face over the next quarter of the century. ASCI submitted its report in July, 2007.

4.8 Urgent need for restructuring to address the emerging challenges

The country is on the path of becoming world leader with its all-round socio-economic development. The demand on water by different sectors for sustaining the pace of development, food security, changing life style and environmental concerns is accordingly increasing. In order to address the emerging challenges in the water sector, there is a urgent need for restructuring of CWC and to gear it up for the task of integrated water

resources development and management and work in close coordination with state governments to achieve the desired goals. As most of the rivers are inter-state, close interaction, consultation is necessarily required with the concerned State(s) during formulation of Basin Plans. Formulation of master plans is multidisciplinary activity and would involve water resources engineers, experts in hydrology, agronomy, economics, law, sociology, public relation, information technology, GIS, systems analysis, environmental analysis including water quality, ecology & biodiversity and management.

Thorough transparency and neutrality in dealing with inter-state matters make CWC the most acceptable organization, not only by the States but also by the hon'ble courts of law and policy makers. Any attempt at restructuring CWC must be guided by the nation’s long-term strategy for management of water resources. Restructuring of CWC will bring the desired synergy in the efforts of Central Government and State Governments for meeting the challenges of water sector in the country.

Chapter - 5

PROPOSAL FOR RESTRUCTURING OF CWC

5.1 Introduction

Restructuring of Central Water Commission basically aims at horizontal expansion of field activities at basin level so as to address the basin level issues in more comprehensive and integrated manner and to take up the responsibilities assigned to MoWR/ CWC under National Water Mission(NWM) to address climate change issues.

In order to have better results in Water Resources sector and better coordination with State Governments, CWC established 13 regional offices in the major river basins during 1994-95. The functions presently being performed at regional offices of CWC include collection and compilation of hydrological and hydro- meteorological data, formulation and dissemination of flood forecasts, appraisal of medium irrigation projects, monitoring of selected major and medium projects including projects under AIBP and CAD&WM, coordination with CWC Head Quarters and State Govt. etc. Present Organisation structure of CWC up to the level of Directorate/circle is given in **Annex -IV**.

A Complete revamping of the present organisation structure and functions to be performed by field organisations and head quarters organisation of CWC has been attempted in proposal of Restructuring of CWC. In order to appreciate the nature of restructuring and change in scope of the activities and quantum of new/additional work to be performed at basin level organisation, in depth study of activities of CWC in each basin has been carried out.

There are 20 river basins in the country out of which 12 are major river basins and 8 composite basins. It has been assessed that eight Regional Offices of CWC, each headed by Chief Commissioner will be able to cater to the requirement of all the 20 basins in the country. The proposed basin-wise field offices have been assigned responsibility for respective basin States for better coordination and faster implementation of the Programmes. The setup at headquarter has also been re-oriented to suit the requirements of the Basins. The entire proposal is based upon the requirement of expansion in existing activities and to take up new activities as elaborated earlier.

5.2 Quantification of expansion in activities / new activities

CWC is rendering multi-dimensional and multi-disciplinary services to the GoI and the State Governments as and when required in addition to certain essential routine works. Analysis of man-power/ man-weeks involved in various activities of CWC at present is given at **Annex-V**. The same annexure also indicates manweeks distribution activity-wise in pie-charts also.

Though, it is very difficult to quantify the workload to be taken up by the CWC an attempt has been made to identify major activities of the CWC having change in scope and additional/ new activities is given below in **Table-5.1**.

Table-5.1 Increase in Scope of Major Activities of CWC

Activity	Existing Quantum	Required to be Taken-up	Remarks
Hydrological Network	878 sites	2794 Sites (Annex VI A)	5000 Required as per norms. However, keeping in view existing sites of other Organisations and Assessment, approx. 2794 sites would be required
Preparation of Basin Plans	---	New Activity	All Basins
Coastal and River Engineering	---	New Activity	
Applied Research		Additional Works	Increased activities in the areas of Remote Sensing, Morphology, Impacts of climate change on water resources, Policy, research, water management, water use efficiency etc.
Dam Safety Measures and related activities		Additional Works	As per proposed Dam Safety Legislation works are likely to increase manifold
Monitoring of Water Resources Projects	130 Visits (average)	330 Visits per year	Existing manpower (last sanctioned 1995-96). Insufficient for the present workload. Monitoring of CAD&WM, FMP and MI Schemes would be additional work
Appraisal of water resources Projects	35 Number (avg.)	100 Number	However, Number will be much more on account of Revised Estimates, ERM Projects, FMP Schemes
Appraisal of Hydro-power Projects	25 Number (avg.)	35 Number	Rapid development in Hydropower sector is resulting in more projects

5.3 Proposed Setup in Basins

The 20 river basins of the country are proposed to be served by 8 Regional Offices, each headed by a Chief Commissioner (Member level Officer) supported by Commissioners/ Chief Engineers and the related set up inclusive of personnel from multi-disciplinary fields such as environment and social, agriculture, economics, groundwater etc. as per requirement.

Organizational setup for the Regional Offices of Restructured CWC has been worked out based on the likely work involved for various new activities to be taken up in the basin in addition to existing activities. Exercise has been undertaken to identify the activities which can be outsourced and processes which can be automated using modern information technologies etc. The proposed basin level Offices are listed as below in **Table-5.2**:

Table-5.2 Proposed Regional Offices under Restructured CWC

#	Offices of	Basin States
1.	Chief Commissioner (Indus)	Jammu & Kashmir, Himanchal Pradesh, Punjab
2.	Chief Commissioner (Upper Ganga)	Uttrakhand, Uttar Pradesh, Haryana, Delhi, Rajasthan, Madhya Pradesh
3.	Chief Commissioner (Lower Ganga)	Uttar Pradesh, Bihar, West Bengal, Jharkhand, Madhya Pradesh
4.	Chief Commissioner (Brahmaputra & Barak)	Arunachal Pradesh, Assam, Manipur, Mizoram, Nagaland, Tripura, Sikkim, West Bengal
5.	Chief Commissioner (Narmada and Tapi)	Madhya Pradesh, Gujarat, Maharastra
6.	Chief Commissioner (Mahanadi and Eastern Rivers)	Orissa, Madhya Pradesh, Chattisgarh, Andhra Pradesh
7.	Chief Commissioner (Krishna and Godavari)	Maharastra, Andhra Pradesh, Karnataka, Madhya Pradesh, Chattisgarh
8.	Chief Commissioner (Cauvery and Southern Rivers)	Karnataka, Tamil Nadu, Kerela

Geographical jurisdiction of proposed Regional Offices is shown in the **Annex- VI**.

5.3.1 Norms for working-out manpower requirement

As the officers to be deployed in different working units will have to undertake wide range of functions, it is very difficult to precisely estimate the time required for different activities. However, the norms of duties with respect to major functions such as designs, appraisal, monitoring, hydrological observation & flood forecasting and investigations have been worked out in detail considering the quantum of work for various activities.

An exercise has been carried out to estimate the man-power requirement at Regional Offices in scientific manner. Methodology adopted to calculate the man-weeks essentially required for carrying out various major activities is detailed below in the **Table-5.3**:

Table-5.3 Methodology to Calculate Man-weeks for Major Activities

Activity	Methodology
Data Collection	Man-weeks for required sites estimated in proportion to the existing number of sites in the basins
Monitoring of Projects	Man-weeks for required visits to the projects calculated in proportion to the increased level of activity
Appraisal of Projects	Man-weeks for required appraisal of the projects calculated in proportion to the increased level of activity
Preparation of Basin Plans	An additional unit headed by a Chief Engineer has been proposed in each Basin Organisation for this activity. Support required for this purpose will be provided by the other units under the Organisation looking after other activities
Coastal Engineering	An additional unit headed by a Chief Engineer has been proposed each for west coast and east coast for this activity. Support required for this purpose will be provided by the other units under various Organisations
Dam Safety related Works	An additional unit headed by a Chief Engineer has been proposed for this activity under Design wing. Requisite support will be provided by the field Organisations.
Research	An additional unit headed by a Chief Engineer has been proposed for this activity at Head Quarters. Requisite support will be provided by the field Organisations.
Others	As per requirement assessed (IT, HRM, IEC, WM etc.)

5.3.2 In-depth analysis for one basin

In-depth analysis for one Regional Office of CWC namely, office of Chief Commissioner (Upper Ganga) has been described in detail at **Annex- VII**.

5.3.3 The Proposed Structure for various Regional Offices of CWC

A similar methodology has been used to workout the details for other Regional Offices depending upon the major issues to be addressed and quantum of work involved for addressing those issues.

The proposed Regional offices of CWC are to be headed by Chief Commissioners (Member level officer) to enable them to take added responsibility and greater autonomy in decision making. There will be increased role of CWC in the basin level activities related to water resources development and management, ranging from data collection, preparation of integrated basin plans, techno-economic appraisal of water resources projects, looking after water management and flood management aspects, dam safety monitoring and inter-state issues etc. As such a senior level officer of rank of Additional Secretary to Government of India would be appropriate to guide and steer the Regional Office of CWC towards the goals and objectives it aspires to achieve.

The Organisation chart of each Regional Office of CWC has been made which gives details of officers up-to the level of Director/ Superintending Engineer and number of officer of DD, AD and AD-II working under each Director are mentioned. This has been made after a careful assessment of issues involved in the basin, area under jurisdiction and quantum of work involved.

5.3.4 Consolidation of Ganga Flood Control Commission and Farakka Barrage Project with CWC

The works being carried out in the Ganga Flood Control Commission (GFCC) are proposed to taken over by the Regional offices of CWC for Ganga basin i.e. (Upper Ganga) and Chief Commissioner (Lower Ganga), and thus, it is proposed to be subsumed in the CWC. One Member level post of Chairman, GFCC would thus transfer to the CWC. Similarly, the Farakka Barrage Project is proposed to be subsumed in the Office of Chief Commissioner (Lower Ganga). It is to note that the technical posts are presently being manned by the CWES-Group 'A' officers in both of these Organizations.

The newly devised monograph for cadre review of Group 'A' Central Services, by DoPT, has also emphasized to carry out such exercises while framing proposal for cadre review. As already brought out that about 87% of CWES-Gr'A' Officers are serving CWC and therefore restructuring of CWC would essentially involve cadre review of the CWES-Gr'A' Officers and other cadres serving CWC.

5.3.5 Officers of Other Discipline

Considering that the new activities, particularly preparation of basin plan are multi-disciplinary, it would require expertise in different fields. Accordingly officers/ experts in the field of ground water, economics, finance, agriculture, environment and sociology have been proposed for different Regional Offices of CWC.

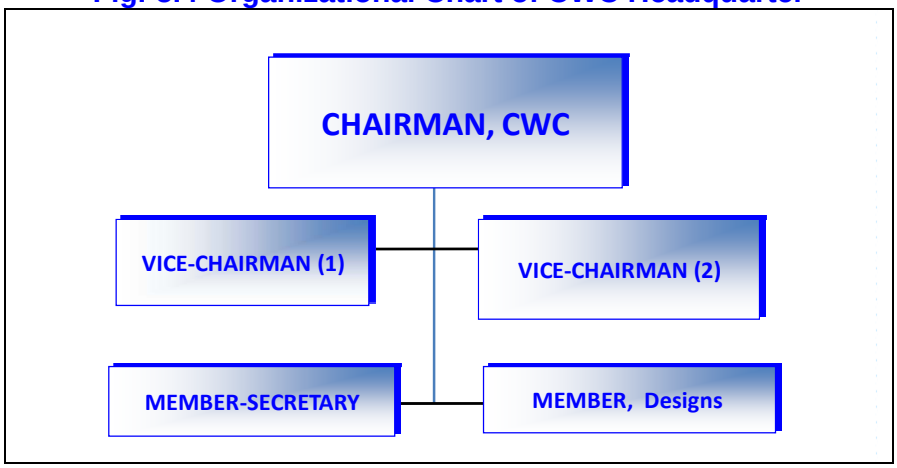
5.4 Proposed Setup at Headquarter

Since the various activities have been proposed to be transferred to Regional Offices of CWC headed by Chief Commissioner, appropriate reduction in overall strength at headquarter has been considered. Under the restructuring/ strengthening plan of CWC, the work of Commission is proposed to be carried out under the overall supervision of Chairman, CWC, supported by two Vice-Chairmen each with the status of Ex-Officio Special Secretary, to look after specific issues facing the country. One of the Vice-Chairmen will be looking after issues pertaining to Ganga basin and International matters while other will be looking after policy issues in the country, water management aspects and handling inter-state issues.

In addition, two Member level officers at Head Quarters will be reporting directly to Chairman CWC. One of them will be Member Secretary, who will be looking after Human Resources development and management issues, financial aspects, IEC activities etc. Another one will be Member (Design) and will be looking after Design activities in the Commission. The Chief Engineer, National Water Academy, Pune will also work under the guidance of Member Secretary, Commission. Thus, the Commission will consist of the Chairman, two Vice-Chairmen and two Members stationed at Head-Quarters.

The organizational setup at headquarter is given below in Fig.-5.4

Fig.-5.4 Organizational Chart of CWC Headquarter



5.5 Proposed Restructured CWC

The complete organizational chart of CWC including its Refional offices and headquarter Offices of Vice Chairmen, Member-Secretary and Member (Designs) is given at **Annex-VIII**. Existing and proposed employees strength for CWC is given in the **Table 5.5** below:

Table.-5.5 Existing and Proposed employees strength of CWC

DESIGNATION	Employees (Existing)	Employees (Required)	Employees (Proposed)	Remarks
	Number	Number	Number	
Group A				
CHAIRMAN	1	1	1	
VC	0	2	2	
MEMBER/ CHIEF COMMISSIONER	4	10	10	
CE/ COMMISSIONER	34	61	*50	* Including One post of Financial Advisor on deputation
DIR/SE	146	248	*194	* including16 posts {one Dir(Env) & one Dir(Fin) at each Regional office of CWC}
DD/EE	241	388	*338	Including 32 posts on deputation from (GW, Econ, Agr, Env/Soc fields at each Regional office of CWC)
AD/AEE	252	424	377	
A(Others)	85	131	101	
Total A	**763**	**1265**	**1073**	123 posts to be reduced at HQ and shifted to Regional offices of CWC
Group B				
AD-II/SDE	373	695	467	
JE	748	1954	1380	
B(Others)	1137	1605	1224	
Total B	**2158**	**4254**	**3071**	
Group C	**2980**	**6172**	***3580**	* including 721 Posts to be abolished on retirement & arranged thro' outsourcing
A+B+C	**5901**	**11691**	**7724**	

5.6 Work Profile at Different Levels

The work profile of Officers upto the level of Director/ Superintending Engineer under different formations at Head Quarters as well as Regional Offices for the Restructured CWC is placed at **Annex- IX**.

5.7 Impact of Restructuring of CWC on various Cadres

As water is multi-disciplinary subject, CWC also has various cadres to serve it in order to meet the given objectives. The first and foremost is the illustrious Central Water Engineering Group 'A' Service which is think tank of water related policies & planning from national perspective giving technological support to the Central as well as the State Governments. The other cadres are listed as below:

Technical Services

- Engineering Cadre Group 'B' (primarily for data collection) - gets merged with CWES-Gr'A';
- Hydro-met Cadre for support to flood forecasting service;
- Scientific Cadre for support to water quality monitoring activities;
- Communication Cadre for support to data transmission during floods;
- Indian Statistical Services Cadre;

Non-Technical Services

- Accounts Services Cadre;
- Central Secretariat Services Cadre;
- Central Secretariat Clerical Services Cadre;
- Central Secretariat Stenographers' Services Cadre;

Impact of restructuring of CWC on these cadres has been included in the proposal of restructuring of CWC. Officers from the domains including Finance, Environment, Groundwater, Economics, Agriculture and Sociology at various levels have been proposed in the restructuring of CWC.

Chapter - 6

RESTRUCTURING OF CWC – Advantage to Nation

6.1 Introduction

Sustainable growth and prosperity can only be achieved by way of sustainable management and development of its life supporting resources. Water is one of the essential life sustaining resource which is to be accorded top priority for its optimal development and management. The related issues are required to be looked at from national perspective considering basin as unit for planning, development and management. The impending threat due to climate change is also required to be analysed and managed in order to reduce its impacts by way of planning and implementing suitable economic adaptation measures. Restructuring of CWC has been proposed keeping these aspects in view. The goals which would be achieved by 2025 are listed in following para.

6.2 Goals of Restructured CWC

Goals for 2025:

- Ready with Basin Plans;
- Establish system for continuous updation of Basin Plans;
- Ready with Water Strategy plans w.r.t. neighboring countries;
- Ready with adaptation measures for climate change;
- Fully equipped with latest know-how in water sector;
- Well developed data collection network, communication and analysis centres;
- Dynamic GIS based Water resources information system in place; and
- Increase in water use efficiency by 20%.

6.3 Advantage to the Nation by redefined roles of Re-structured CWC

- **Basin Plan will be a tool in the hand of Central Govt. which would:**
  - Help to achieve Optimal Utilisation of Water Resources through Integrated Development and Management of Water Resources
  - Provide comprehensive information about availability, utilisation and demand of water in the Basin which shall lead to meaningful dialogue among the Stakeholders for resolving various issues.

- Help in optimal planning to address temporal and spatial variation of water availability (intra-basin as well as inter-basin)
- Lead to comprehensive planning of all the related aspects of water sector, such as, conjunctive use, water quality, ecology, environment etc.

- Focused attention to Water Management aspects which would lead to efficient use of water
- Set-up in the field closer to the states would help in speedy implementation of the programmes and policies of Ministry of Water Resources
- Focused attention to dam safety issues would play a major role in disaster management
- Provide a platform for addressing Coastal Erosion related issues

The above would provide enormous benefits to the Nation in terms of economic and social development and will far outweigh the financial implication of Restructuring of CWC

Annexures

List of Annexures

Annex-I (Para 4.1 of report**)**

Evolution of Central Water Commission

The Central Water Commission has evolved after many changes from the first organized initiative to manage water resources by establishing Irrigation Department in 1867 by British rule, to its present form to serve the nation to take up the challenges of the times. An account of development of the organization and other major policy changes since its inception is as tabulated below:

1867	Establishment of Irrigation Department.
1919	Irrigation became provincial subject; Power to sanction irrigation projects beyond Rs.5 million remained with Central Government in addition to projects having inter-provincial implications.
1935	Irrigation continued to be provincial subject even after the GOI Act of 1935 passed.
1945	A high level body "**Central Waterways Irrigation and Navigation Commission (CWINC)"** was set up with one Chairman, two Members and six Directorates for considering large irrigation projects vide Department of Labour Resolution No. DW 101(2) dated 05.04.45.
1951	The CWINC and the Central Electricity Commission were merged to form the **Central Water and Power Commission (CWPC)** for better co-ordination between the irrigation and power sectors to give more emphasis to hydropower sector.
1957 & 1967	Two committees appointed by the GoI commended the work of CWPC and recommended it's strengthening.
1965	Central Water Engineering Services (CWES) Group 'A' created.
1974	CWPC was bifurcated into the **Central Water Commission (CWC)** and the **Central Electricity Authority (CEA)**, the former being charged with the development of irrigation and of water resource management (WRM).
1994-95	CWC widened its field formation mainly to orient itself in-line with basins and decentralized project appraisal and monitoring activities in addition to expansion of hydrological network, flood forecasting, survey & investigation works etc. through its 13 Chief Engineer level offices throughout the country. These offices maintained close coordination with the related State agencies and subsequently entrusted with the more works including appraisal & monitoring of AIBP projects, monitoring of CAD & WM projects and later on schemes under Flood Management Programme being implemented by the States.

Annex-II (Para 4.1 of report**)**

Role and Functions of CWC

CWC is charged with the general responsibility of initiating, coordinating and furthering in consultation with the State Governments concerned, schemes for the control, conservation and utilization of water resources in the respective State for the purpose of flood management, irrigation, drinking water supply and water power generation. The Commission, if so required, can undertake the construction and execution of any such scheme.

In exercise of the above responsibilities following are the main functions of CWC:

- Collection & analysis of hydrological data.
- Flood and River management including flood and inflow forecasting, morphological studies.
- Surveys, investigation and preparation of Detailed Project Reports (DPRs) for Water resources development projects.
- Techno-economic appraisal of WR and power projects.
- Monitoring of water resources development Projects.
- Environmental and Socio-economic issues.
- Issues related to efficient irrigation management and water utilization namely performance overview/evaluation and benchmarking of irrigation projects.
- Matters related to inter-state water disputes and international matters.
- Engineering Design consultancy.
- Hydrological studies.
- Dam Safety aspects.
- Guidelines and policy matters regarding integrated planning, development and management for River Basins considering both surface and ground water.
- Human resources management issues such as Induction training of new CWES-Gr'A' officers, training programmes for in-service officers and cadre management of officers and staff.

Annex-III (Para 4.5 of report**)**

Present Strength of Group 'A' officers of CWC (CWES Cadre)

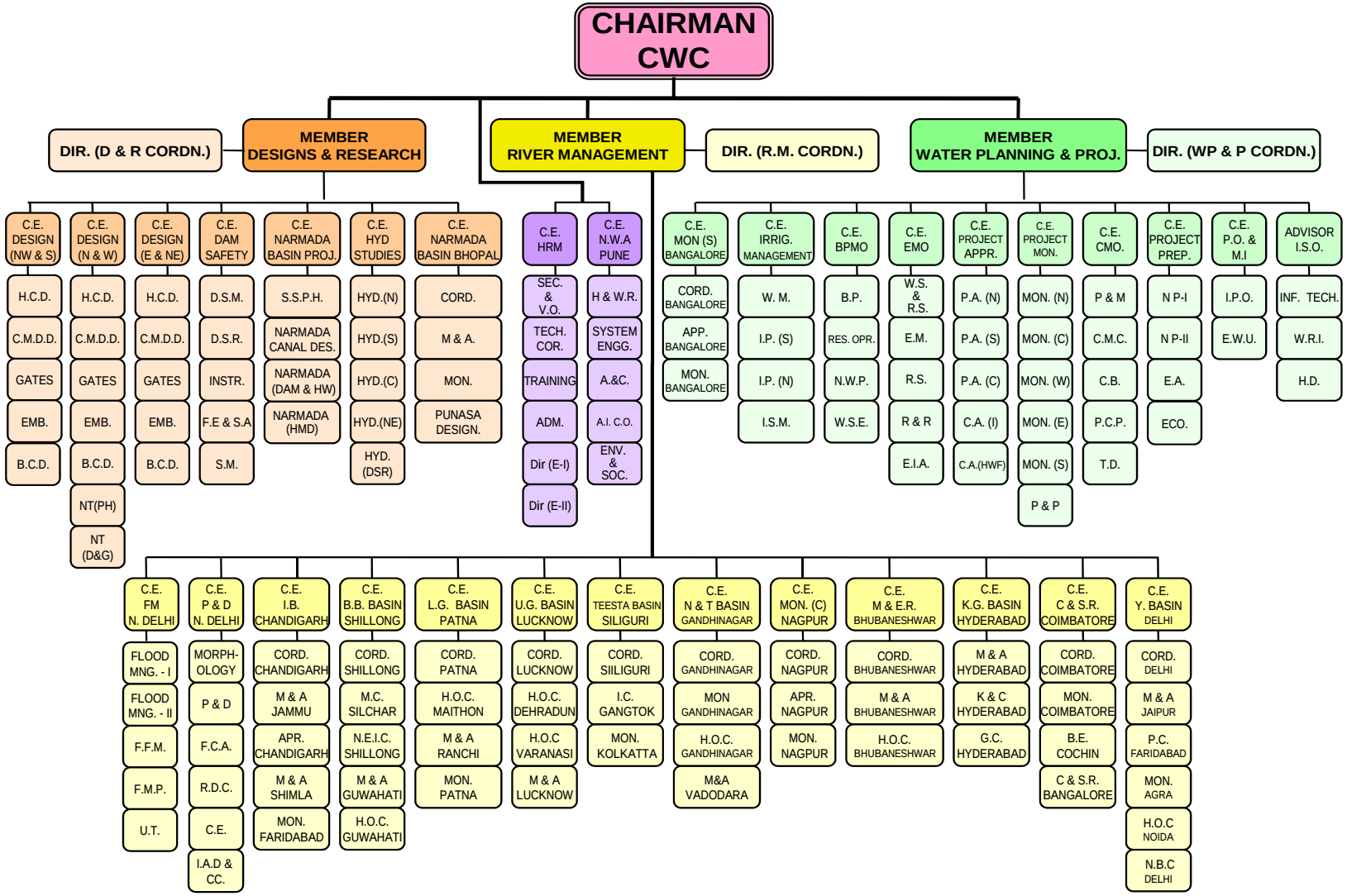
Sl No	Category	CWC	Other Organisations	Total
1.	Chairman	1	-	1
2.	Member	3	1	4
3.	Chief Engineer	31	10	41
4.	Director	139	29	168
5.	Deputy Director / Executive Engineer	222	27	249
6.	Assistant Director/ Assistant Executive Engineer	244	18	262
	Total	**640**	**85**	**725**

(Other Cadres)

	Category	No. of Posts
1.	Adviser (ISS)	1
2.	Director (Admn.)/Director (Estt.)/ Deputy Secretary	3
3.	Director (ISS)	3
4.	Director (Eco.)	1
5.	Director (System Eco.)	1
6.	Deputy Director (WL)	1
7.	Deputy Director (Telemetry)	1
8.	Deputy Director (Hydromet)	4
9.	Deputy Director (ISS)	7
10.	Deputy Director (Economic)	2
11.	Deputy Director (Official Language)	1
12.	Assistant Director (WL)	5
13.	Assistant Director (Electronic)	1
14.	Assistant Director (Economic)	2
15.	Assistant Director (ISS)	6
16.	Assistant Director (Hydromet)	6
17.	Research Officer (RO)	6
18.	Under Secretary	11
19.	Accounts Officer	1
20.	Editor (Bhagirath – Hindi)	1
21.	Editor (Bhagirath – English)	1
22.	Principal Private Secretary (PPS)	1
23.	Library & Information Officer	1
	Total	**67**

Annex-IV (Para 5.1 of report**)**

Present Organisation Set-up of CWC



Annex-V (Para 5.2 of report**)**

Analysis of number of Officers Engaged in different Activities

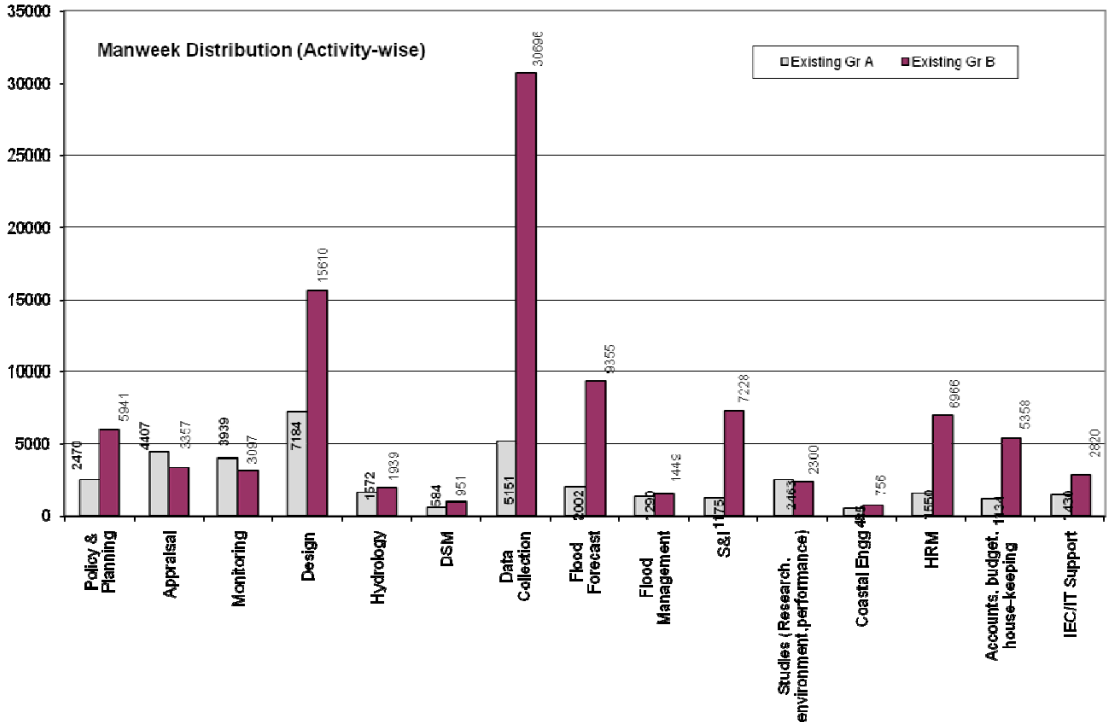
The Officers in CWC are generally performing more than one activity at any given place of posting and at any given time, for example, Officers involved in data collection are also devoting time to flood forecasting activities or Officers posted in Design Directorate are also performing Project Appraisal activity. However, based on the time devoted by them for broad categories of the activities, an in-depth analysis has been made to assess the no. of Officers performing different activities of CWC and indicated in the table below. Only Group 'A' and Group 'B' Officers were considered for the analysis.

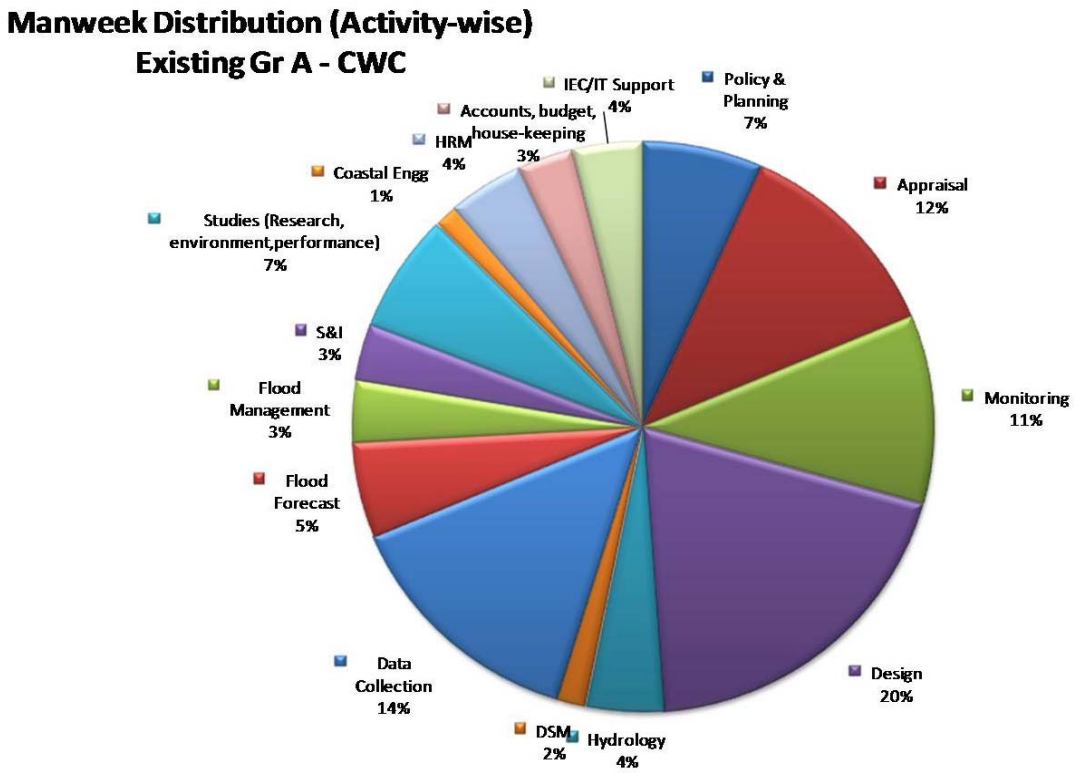
No. of Officers Engaged in Broad Activities of CWC

Broad Category of the Activities	No. of engaged Officers in	
	Group 'A'	Group 'B'
Policy & Planning	48	114
Project Appraisal	85	65
Project Monitoring	76	60
Engineering Design	138	300
Hydrology	30	37
Dam Safety Aspects	11	18
Data Collection	99	590
Flood Forecasting	39	180
Flood Management	25	28
Survey & Investigation and preparation of DPR	23	139
Studies (Research, environment, performance)	47	44
Coastal Engineering	9	15
Human Resource Management	30	134
Accounts, budget, house-keeping	22	103
IEC/IT Support	28	54
Total	**708**	**1881**

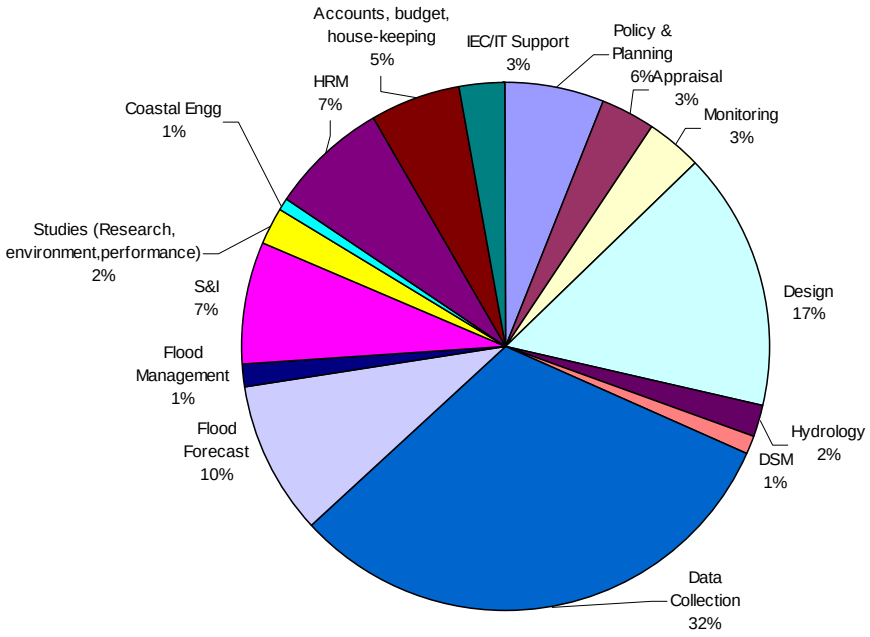
Man-weeks being put in by the Group 'A' and Group 'B' Officers for above mentioned broad categories are also shown in bar chart format jointly and in pie chart format separately in figures given below:

Activities-wise Man Week put in by Officers





Manweek Distribution (Activity-wise)
Existing Gr B - CWC



Annex-VI (Para 5.3 of report**)**

Geographical Jurisdiction of Proposed Basin Level Offices

Annex-6A

Increase in No. of HO sites in Various Basins

S. No.	Name of Basin Offices proposed under Restructuring of CWC	Existing Sites	Proposed Sites
1.	Indus Basin Organisation	36	298
2.	Upper Ganga Basin Organisation (including Yamuna basin)	174	429
3.	Lower Ganga Basin Organisation (including GFCC & FBP)	111	430
4.	Brahmaputra Basin Organisation (including Barak & Teesta basin)	163	259
5.	Narmada and Tapi Basin Organisation (including west flowing rivers in the region)	99	223
6.	Mahanadi and Eastern Rivers Basin Organisation	73	335
7.	Krishna and Godavari Basin Organisation	125	684
8.	Cauvery and Southern Rivers Basin Organisation	97	136
	Total	878	2794

Annex-VI (Para 5.3.2 of report**)**

IN-DEPTH STUDY OF ONE REGIONAL OFFICE OF CWC
-Office of Chief Commissioner (Upper Ganga)

Ganga Basin is the largest basins in the country, covering major portion of North India. Under Restructured setup two regional offices have been proposed viz. Office of Chief Commissioner (Upper Ganga) and Office of Chief Commissioner (Lower Ganga). The works of Ganga Flood Control Commission (GFCC) are proposed to be divided among the two Regional Offices as per jurisdiction and works of FBP are proposed to be handled by Office of Chief Commissioner (Lower Ganga). The in depth analysis for proposed office of Chief Commissioner Upper Ganga is given below:

Present set-up

Under the present setup, Upper Ganga Basin Organisation, Lucknow, is headed by a Chief Engineer and supported by Director (Coord.), Director (Monitoring and Appraisal), Lucknow, Superintending Engineers(HOC) at Dehradun and Varanasi, Dy. Director and four Executive Engineer along with other supporting staff. Similarly, Yamuna Basin Organisation, New Delhi is headed by a Chief Engineer and supported by Superintending Engineer (Coord.), Director (Nepal, Bhutan Coordination), S.E. (Planning Circle), SE (HOC), Nodia, Director (Monitoring), Agra, Director (Monitoring and Appraisal), Jaipur and 7 Deputy Director / Executive Engineer along with supporting staff. Thus in total there are 2 Chief Engineer, 10 Director/Superintending Engineer level and 12 Deputy Director/Executive Engineer level officers to carry out activities mentioned above.

Roles envisaged for Office of Chief Commissioner (Upper Ganga)

Preparation of river basin plans itself is a Herculean task which requires collection and compilation of large amount of field data from various sources - Central & State Govt. Departments/Agencies, water availability and utilisation data, etc. It then involves detailed study of the basin considering present level of development and future needs. Basin states have to come together and arrive at a consensus for preparing river basin plans acceptable to each of the co-basin states. Generally, the basin plans are prepared by River Basin Organisations having representation from the basin states. But as formation of RBOs have not taken place due to lack of consensus, Regional Offices of CWC will make an attempt to prepare technical documentation related to Basin planning and this may help in decision making process. The Regional Offices of CWC may serve as secretariat to River Basin Orgnisations, as and when they are formed.

Basin plans also need to be revised after certain intervals, in view of changed water resource scenarios and changed priorities. Regional office of CWC have to work in close coordination with basin states to prepare basin plans to cater to the future needs of the basin.

To have a holistic approach in planning and development of water resource projects, persons having expertise in field of Agriculture, economics, Social and environmental aspects are also proposed to be included and posted at Regional offices.

There will be focussed attention to Water Management aspects which would lead to efficient use of water. Performance evaluation of existing and old projects with a view to identify causes of system deficiencies and recommend suitable corrective measures to improve efficiency in water use, encouraging participatory Irrigation Management with active involvement of farmers and stake holders etc., are some of measures that need to be initiated and popularised by Regional Offices of CWC.

The hydrological network needs to be expanded taking into consideration World Meteorological Organisation (WMO) norms, expansion and modernization of Flood forecasting network to cover major cities and towns in the country and goals identified under national water mission. At present CWC is having hydrological observation sites on main rivers only. These need to be expanded and H.O sites have to be established on important tributaries joining the main river. This will help in better flood and inflow forecasts and improve the accuracy and reliability of data for water resource assessment.

In order to expedite the process of appraisal of project proposals submitted by State Govt. and to have better coordination with State Govt. & project authority, appraisal of major project are also proposed to be carried out at basin level offices. Sufficient trained manpower from various related fields has to be provided at Regional offices to look into details of projects. To look into details of design aspects, the detailed project reports may be referred to CWC central office which will continue to have specialised design wing.

To sum-up, the restructured set-up of CWC will be able to cater for following major roles/ activities in the basin:

- Preparation of technical document to support River Basin Plans for IWRD in all Basins
- Expansion, Modernisation and Automation of data collection Network of CWC as well as Flood Forecasting Activities
- Water Management aspects
- Provide adequate Set-up to meet increasing monitoring responsibilities

- Set-up in the field closer to the states for Appraisal of all the Projects
- Improved and focused attention to dam safety issues
- Provide set-up in the field to address the issues related to Coastal Erosion
- More intensive role in water quality issues
- Capacity building
- More focus in the Research area

Methodology adopted to calculate manpower requirement

Methodology adopted to calculate manpower requirement for various activities of Restructured basin is illustrated as under:

First of all, an exhaustive list of various type of activities which are being carried out at regional offices of CWC under existing set up and also the new/ additional activities which are proposed to be performed by restructured offices was prepared. Thereafter percentage of time or man-weeks devoted by different level of officers for these identified activities was worked out.

For example, a Chief Engineer level officer has to devote his time on variety of activities being performed in his jurisdiction viz. appraisal, and monitoring of irrigation and multipurpose projects, maintenance and up gradation of hydrological data collection network, survey and investigation of water resources projects, functions related to human resources management and administrative functions etc. His contribution to various activities in terms of man-weeks are worked out.

Similarly a Director/Superintending Engineer officer or Executive Engineer level officer has to devote time on various technical work assigned to him, human resources management and administrative functions or other specific assignments made to him by his superiors from time to time.

Thus a list giving contribution of different levels of officers and staff in terms of man-weeks for identified activities is prepared and given in table below:

Activities-wise Man-week assessment of Officers

Distribution of man-weeks of existing set-up under UGBO and YBO			
	Total A	**Total B**	**A+B+C**
Appraisal	182	185	710
Monitoring	322	278	1131
Hydrology	0	0	0
Dam Safety related activities	0	0	0
Data Collection	1027	6851	19328
Flood Forecast	450	2951	8658
Basin Plan	0	0	0
Survey & Investigation	81	814	2187
HRM	96	530	1525
Accounts, budget, house-keeping	144	796	2287
IEC / IT Support	89	839	2247
Total	**2390**	**13244**	**38072**

Considering the need to take up activities in view of emerging challenges and the activities identified under the National Water Mission, major activities with change of scope are listed below:

Activity	Existing Quantum	Required to be Taken-up	Remarks
Hydrological Network	174 sites	429 Sites	Keeping in view of the norms /requirements in this regard.
Preparation of Basin Plans	---	New Activity	
River Engineering	---	New Activity	
Applied Research		Additional Works	Increased activities in the areas of Remote Sensing, Morphology, Impacts of climate change on water resources, Policy, research, water management, water use efficiency etc.
Dam Safety Measures and related activities		Additional Works	As per proposed Dam Safety Legislation works are likely to increase manifold
Monitoring of Water Resources Projects	15 Visits (average)	40 Visits per year	Existing manpower (last sanctioned 1995-96). Insufficient for the present workload. Monitoring of CAD&WM, FMP and MI Schemes would be additional work
Appraisal of water resources Projects	8 Number (avg.)	16 Number	However, Number will be much more on account of Revised Estimates, ERM Projects, FMP Schemes
Appraisal of Hydro-power Projects	4 Number (avg.)	6 Number	Rapid development in Hydropower sector is resulting into more projects

Based on the above, proportionate increase in man--weeks required for each existing activity has been calculated and man-weeks required for new activities is estimated.

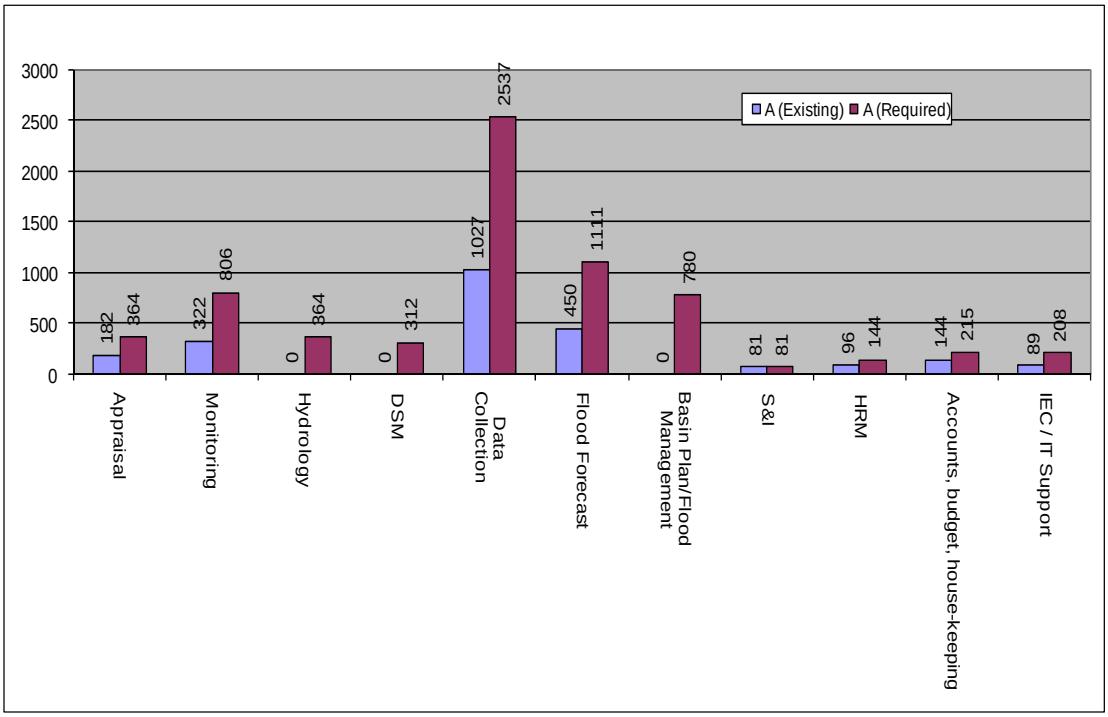
For example: for Hydrological network, the number of Hydrological Observation (HO) sites are proposed to be increased from 174 to 429, for which multiplication factor works out to be about 2.5, which is than multiplied with existing man-weeks to assess man-weeks requirement for the activity after restructuring.

Similarly, man-weeks assigned to appraisal activity is increased by 2 times, as under restructured setup techno-appraisal of major projects are also to be performed at Regional offices and the quantum of work under this activity is likely to increase more than 2 times of the present work load.

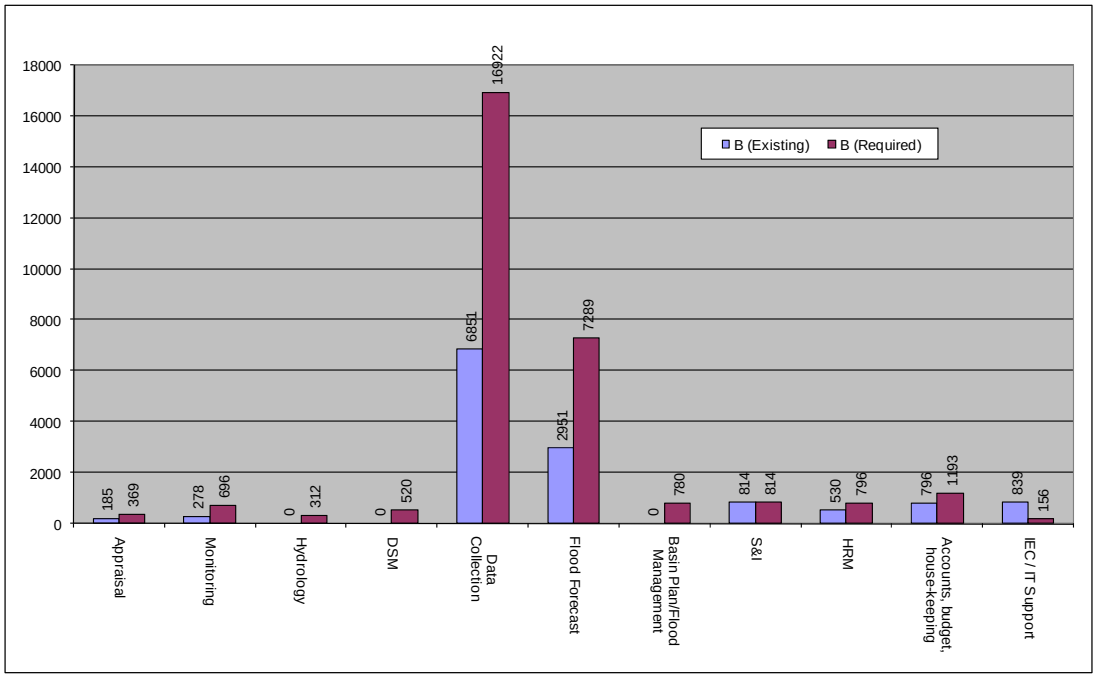
Multiplication factor for monitoring activities is taken as 2.5, taking into consideration increased quantum of work and increased number of visits to be performed, due to increased monitoring responsibility on account of AIBP schemes, CAD Project, Monitoring of demonstrations under FPARP scheme initiated and funded by MoWR, Monitoring of Flood Management Schemes, etc. Man-weeks devoted by various level officers for arranging and performing such visits and submitting monitoring reports is also worked out. Here, it is to be noted that since last cadre review of Central Water Engineering Services that took place in 1994-95, monitoring responsibility has increased manifolds due to inclusion of works like projects funded under AIBP Scheme, CAD&WM projects, works under Flood Management Programme, etc.

For new activities, such as preparation of documentation for basins plans, Water Management aspect etc. where present activities field offices are negligible, a fair estimate of man weeks requirement has been made after assessing quantum of work involved in such activities by officers and staff of different levels.

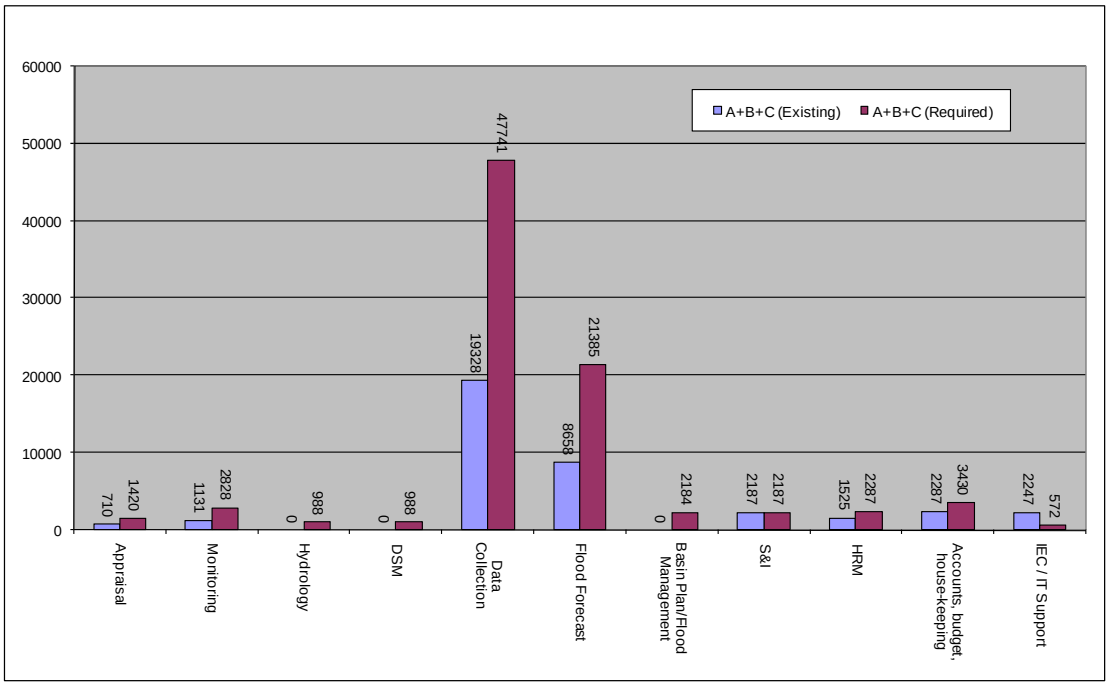
Functions such as hydrology study, dam safety monitoring, designs related functions, are presently being performed at Head Quarter level but are proposed to be done at Regional office level also, as they will have to support activities such Appraisal of Projects, provide inputs for preparation of basin plan, to look after Dam safety aspects etc. Human Resources Management and Finance related functions will also increase due to increase in manpower at Regional offices and due to delegation of more responsibility and autonomy to carry out majority of function at there offices. Thus, a detailed assessment of man-week requirement is made for the office of Chief Commissioner (UG), which is then converted to man power requirement to carry out functions envisaged for the restructured basin organisation.



Activities-wise Man-week assessment of Officers (Group 'A') for Office of Chief Commissioner (Upper Ganga)



Activities-wise Man-week assessment of Officers (Group 'B') for Office of Chief Commissioner (Upper Ganga)



Activities-wise Man-week assessment of Officers (Gr. A+B+C) for Office of Chief Commissioner (Upper Ganga)

Adopting the above detailed methodology for working out man-weeks, the organizational setup of Upper Ganga Basin Organisation is given in the table below:

Required Organizational Setup for Upper Ganga Basin Organization

Designation	Employees (Existing)	Employees (Required)
	Number	Number
Group A		
Chief Commissioner	0	1
Chief Engineer/ Commissioner	2	5
Director/Superintending Engineer	9	25
Deputy Director/ Executive Engineer	11	36
Assistant Director/ Assistant Executive Engineer	19	52
A (Others)	4	13
Total A	**45**	**132**
Group B		
Assistant Director-II/Sub-Divisional Officer	30	70
Junior Engineer	147	320
B (Others)	78	184
Total B	**255**	**574**
Total C	**432**	**945**
Grand Total (A+B+C)	**732**	**1651**

Consolidated optimized manpower requirement

1. Services to be Outsourced

An in-depth analysis has been made to identify the services which can be outsourced and accordingly only 564 no. Group 'C' employees are being proposed for Office of Chief Commissioner (Upper Ganga) in place of requirement of 947 posts. Some posts which are in excess have been proposed to be abolished also. A consolidated statement showing net requirement of Upper Ganga Basin Organization is tabulated below.

2. Automation of Processes

With utilization of information technology in office working and automation in data collection the requirement of Officers would be further reduced at various levels. In office of Chief Commissioner (Upper Ganga) itself, it has been found that there could be reduction of about 27% in Group 'A' posts and accordingly the requirement of 131 Officers has been reduced to 96 only which has been proposed. Similarly, 399 Group 'B' posts have also been proposed against the requirement of 574 as worked out using the norms for calculating the manpower requirement. The consolidated proposed can be seen at Table below.

3. Multidisciplinary approach

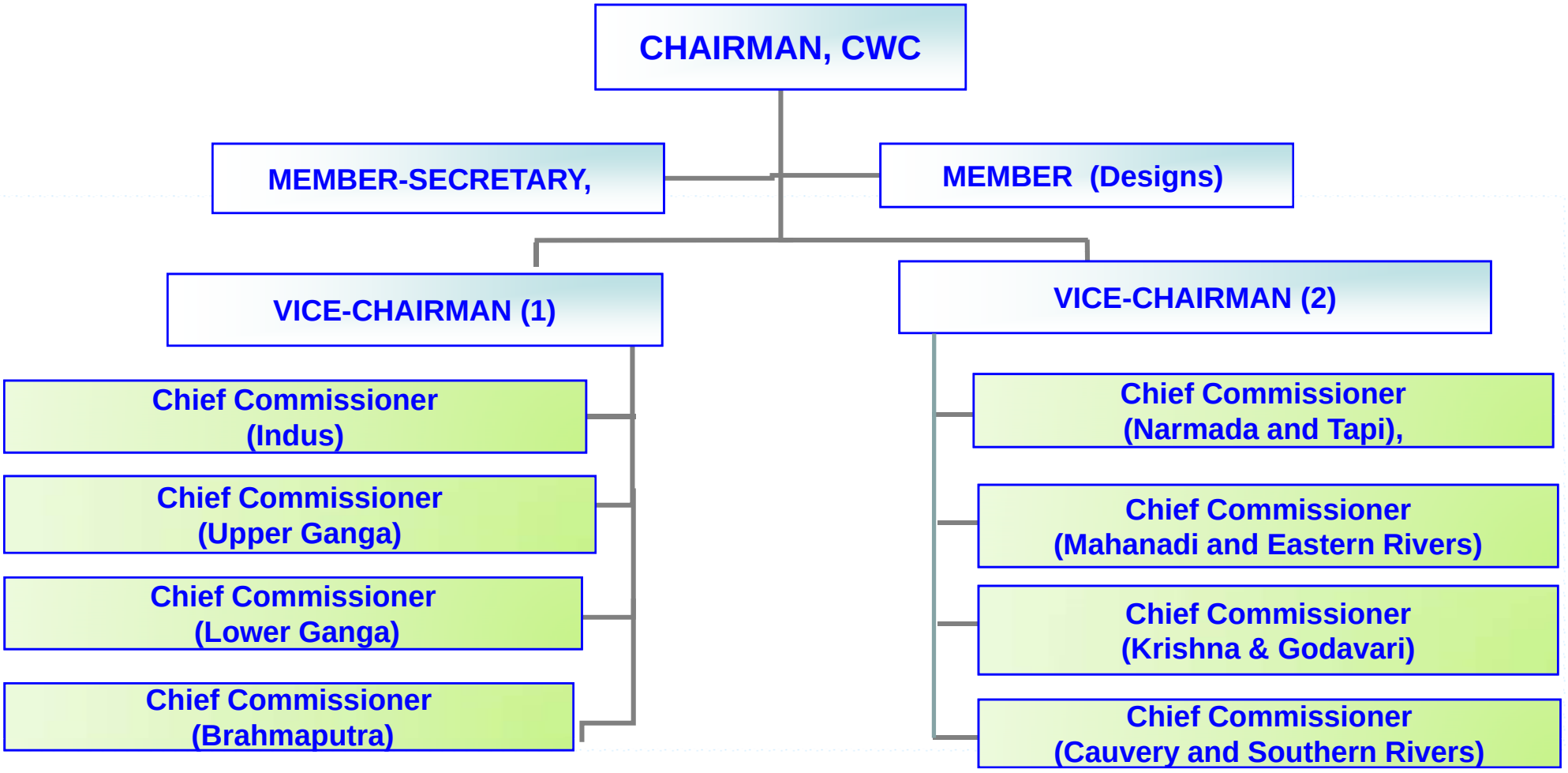
Considering that the new activities, particularly preparation of basin plan are multi-disciplinary, it would require expertise in different fields. Accordingly officers/ experts in the field of ground water, economics, finance, agriculture, environment and sociology have been proposed for different Regional Offices of CWC.

The consolidated optimized requirement as worked out using the norms and thereafter proposed after considering the outsourcing of activities and utilization of information technology and automation in data collection and officers of other discipline has been shown in Table (as given below) :

Consolidated Net Organizational Setup of Upper Ganga Basin Organization

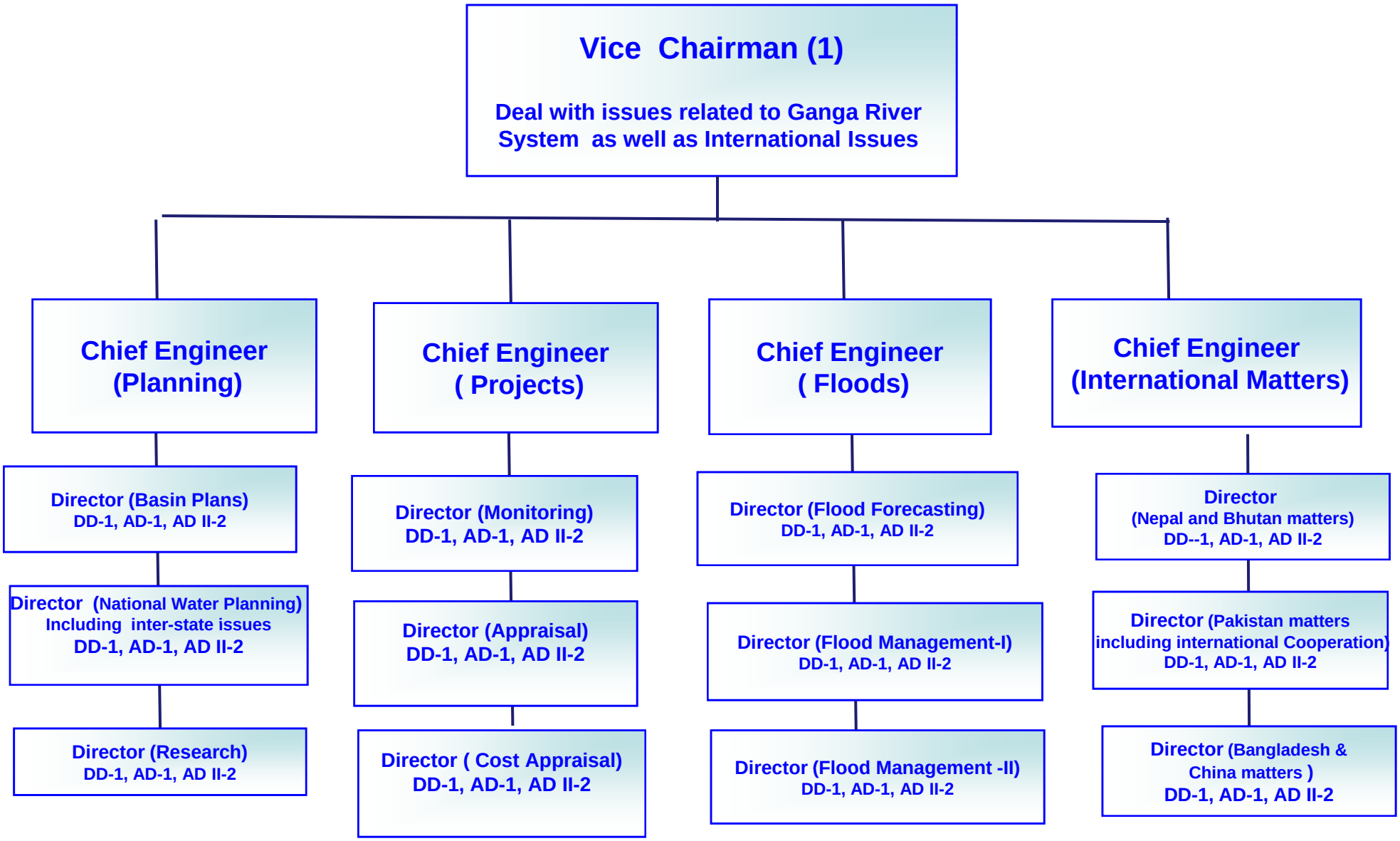
Designation	Employees (Required)	Employees (Proposed)	Remarks
	Number	Number	
Group A			
Chief Commissioner	1	1	
Chief Engineer/ Commissioner	5	4	
Director/Superintending Engineer	25	*16	*Including two posts, one of Director Finance and other Director (Env & social)
Deputy Director/ Executive Engineer	36	*29	* Including 4 posts of DDs, one each from GW, Econ., Agr, Env & soc.
Assistant Director/ Assistant Executive Engineer	52	39	
A (Others)	13	7	
Total A	**132**	**96**	
Group B			
Assistant Director-II/Sub-Divisional Officer	70	47	
Junior Engineer	320	200	
B (Others)	184	152	
Total B	**574**	**399**	
Total C	**945**	***564**	* Including 125 Posts to be abolished on retirement and arranged through outsourcing
Grand Total (A+B+C)	**1651**	***1059**	* Including 125 Posts to be abolished and two posts of Director and four posts of DDs to be taken on Deputation

Proposed Organizational Structure of CWC



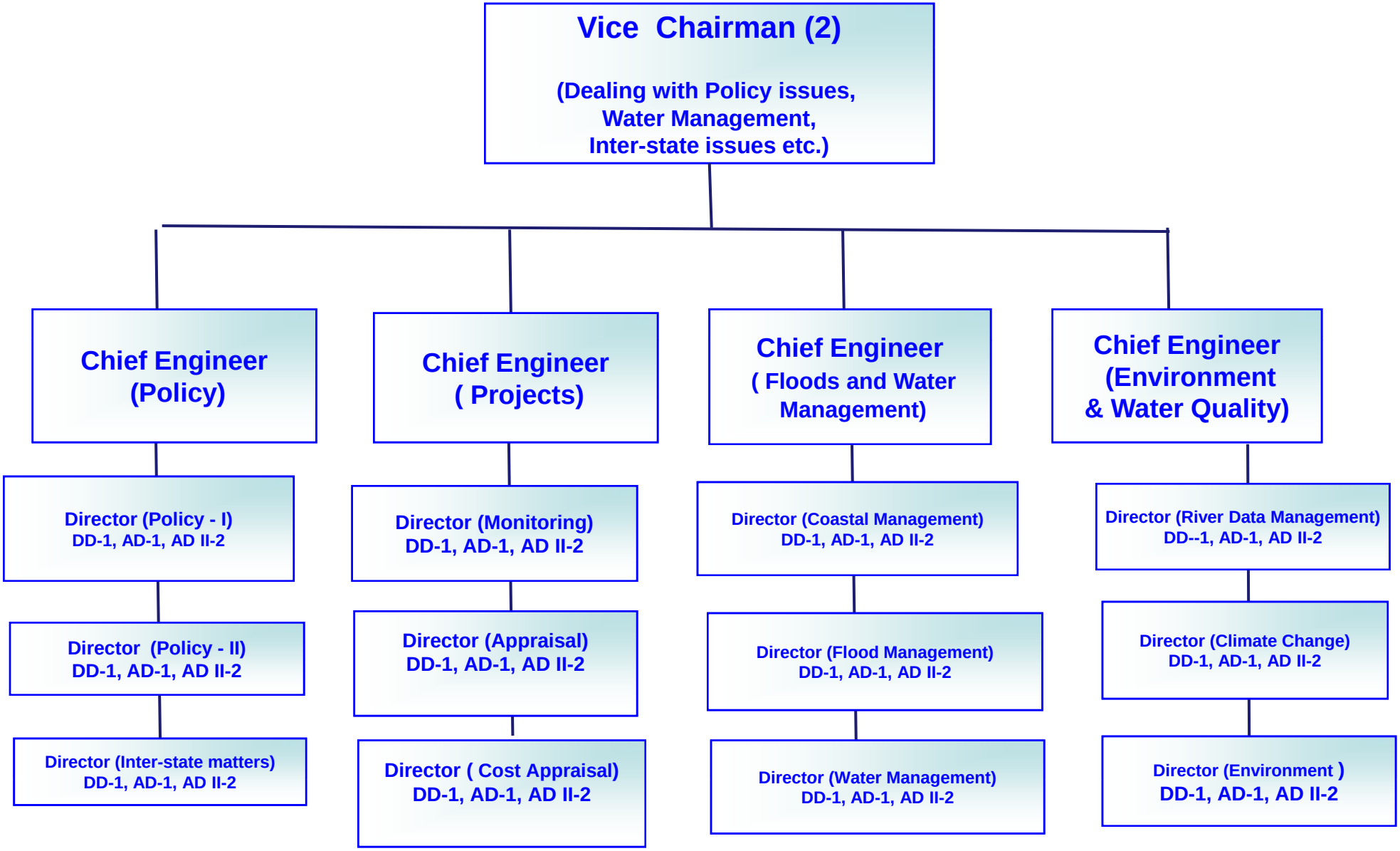
Annexure -VIII / Sheet -1

Organisation Set-up of Vice-Chairman (1) at Head-Qtr



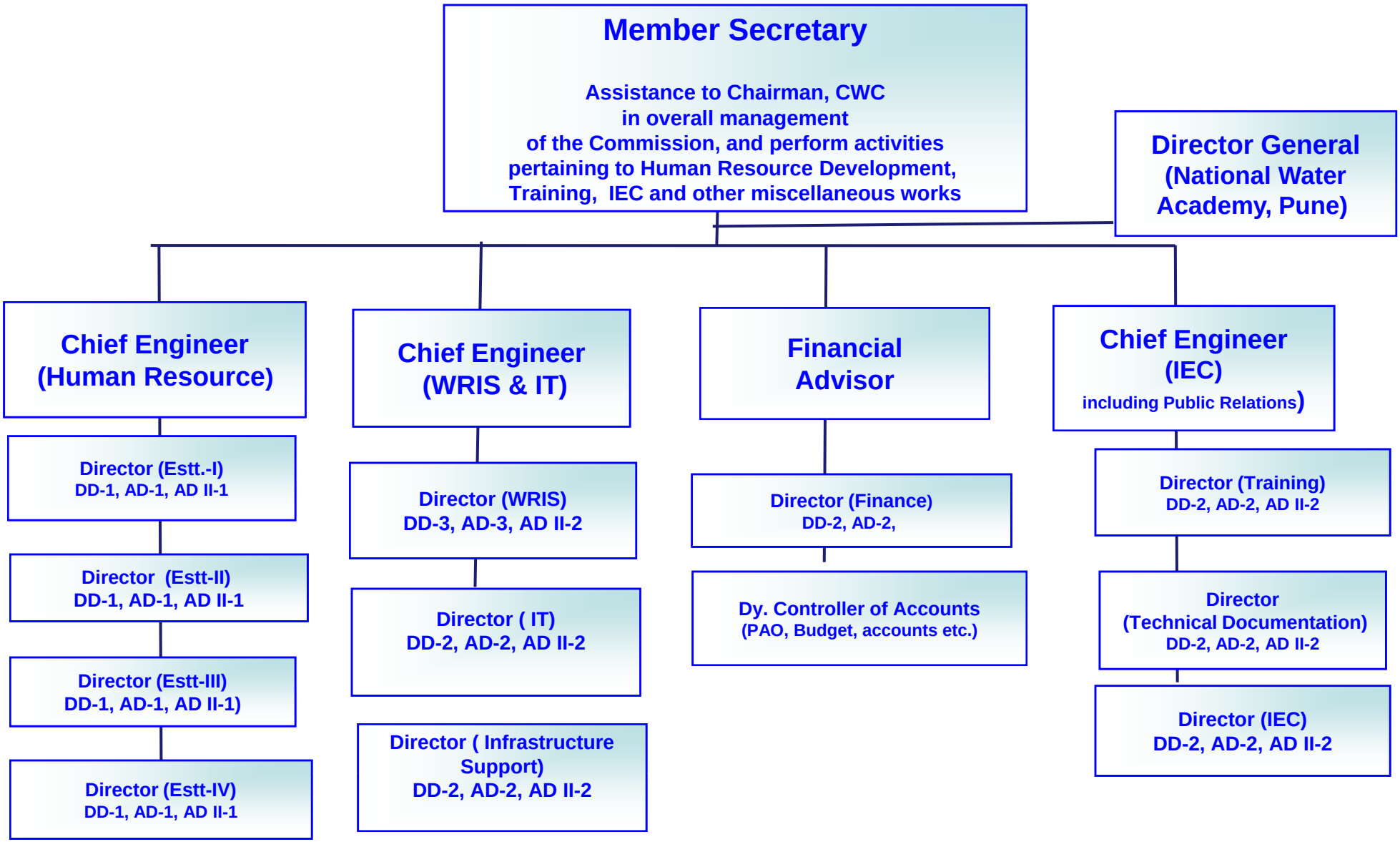
Annexure -VIII / Sheet -2

Organisation Set-up of Vice-Chairman (2) at Head-Qtr



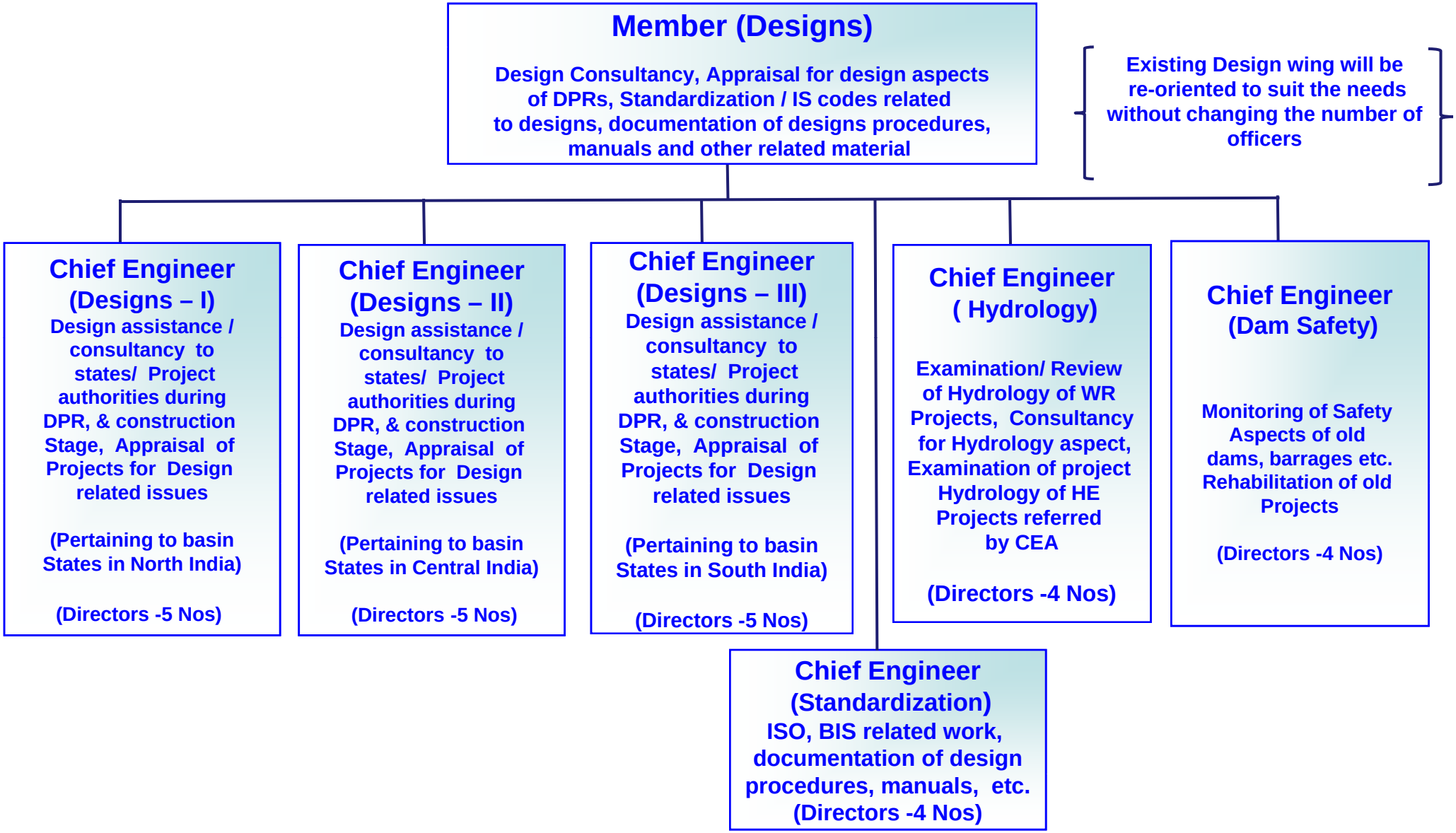
Annexure -VIII / Sheet -3

Organisation Set-up of Member Secretary at Head-Qtr

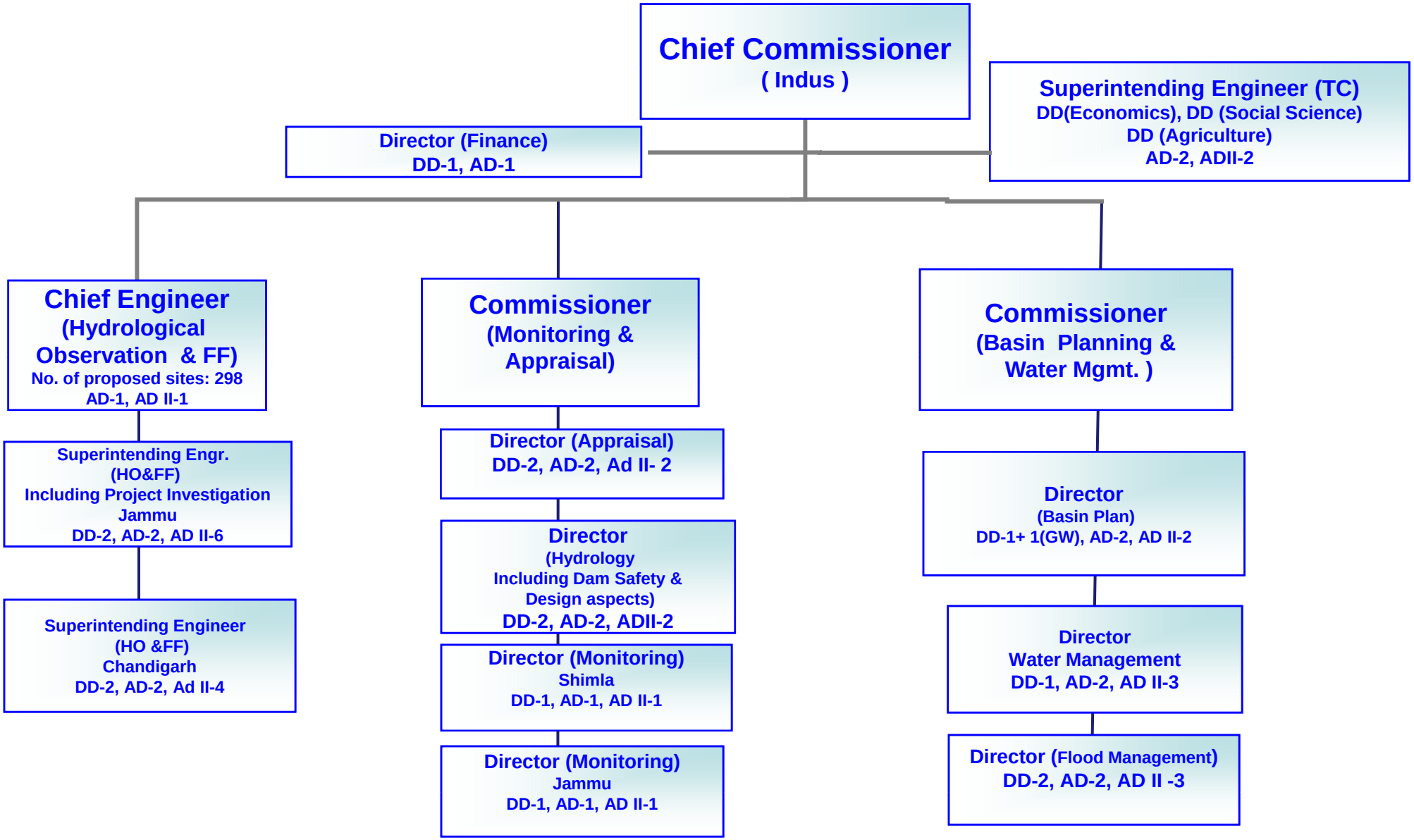


Annexure -VIII / Sheet -4

Member (Designs)

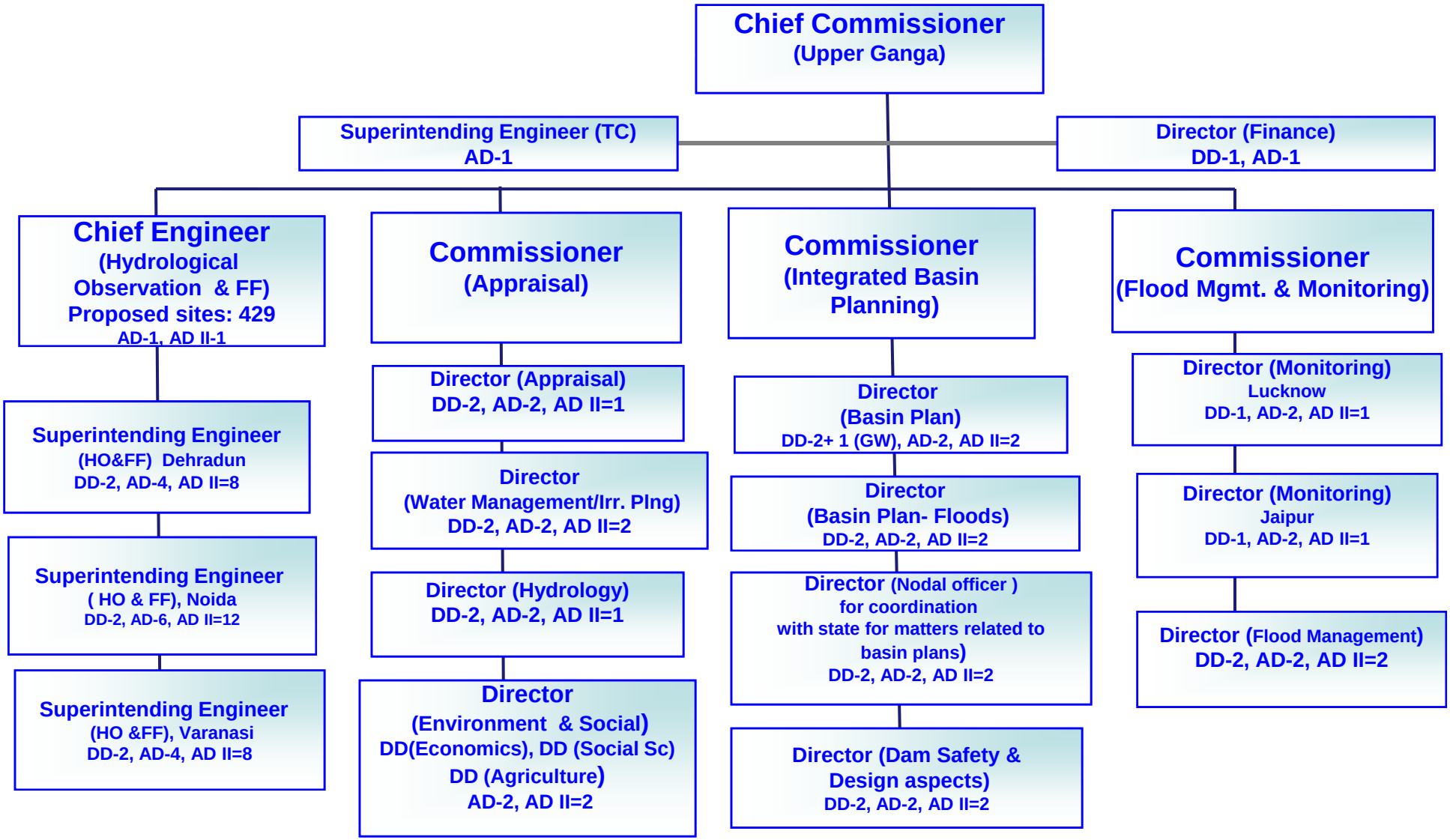


Office of Chief Commissioner (Indus)

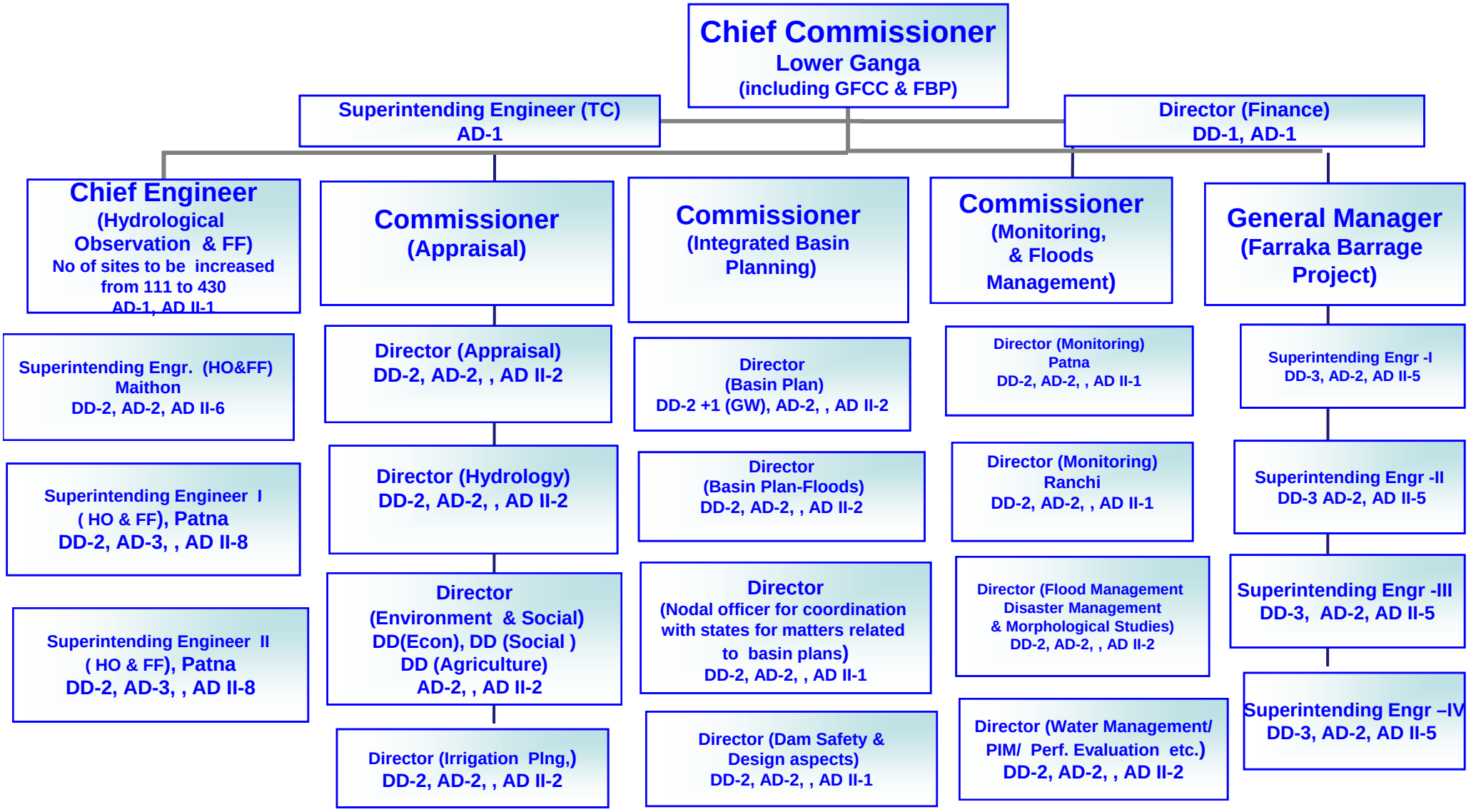


Annexure -VIII / Sheet -6

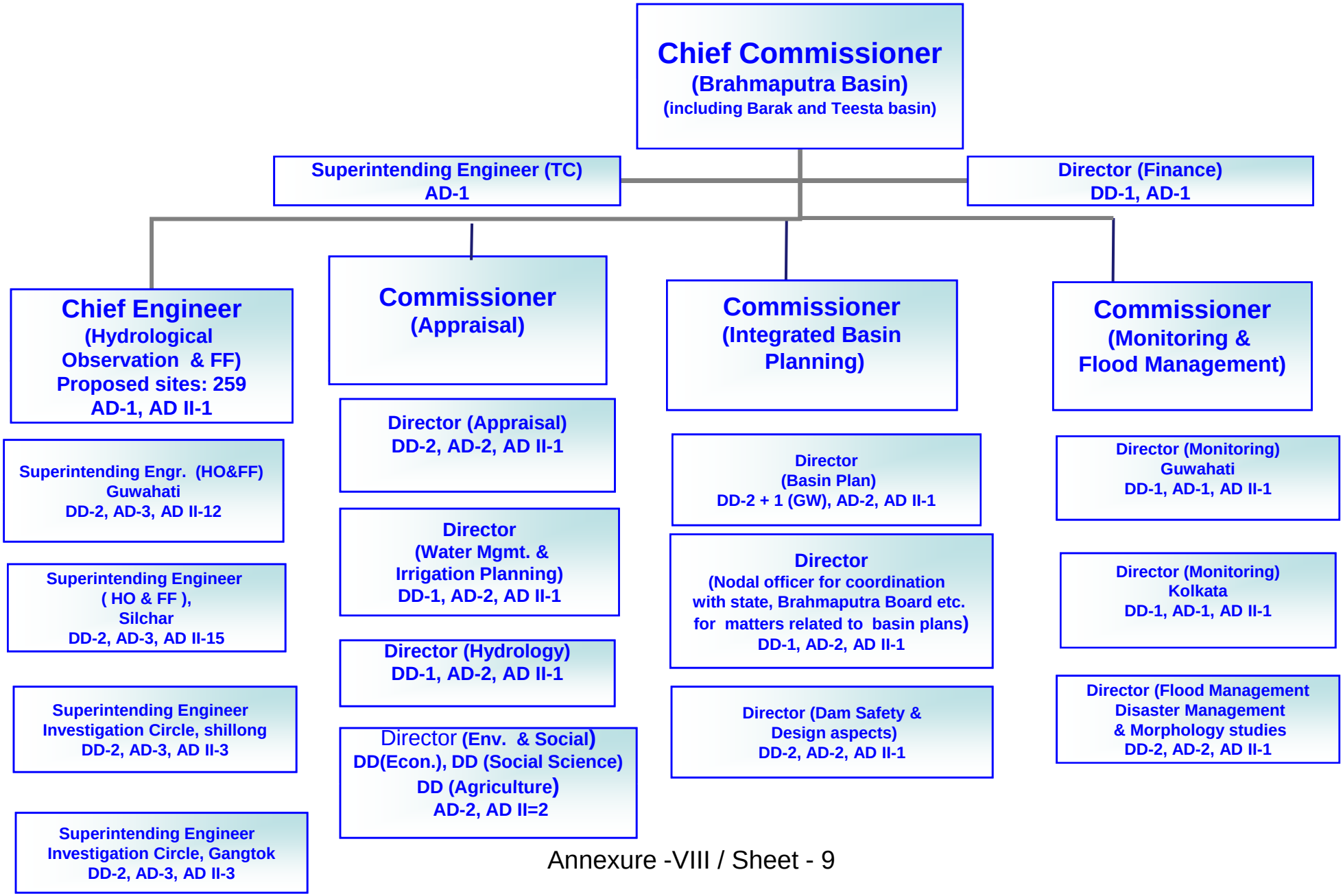
Office of Chief Commissioner (Upper Ganga)



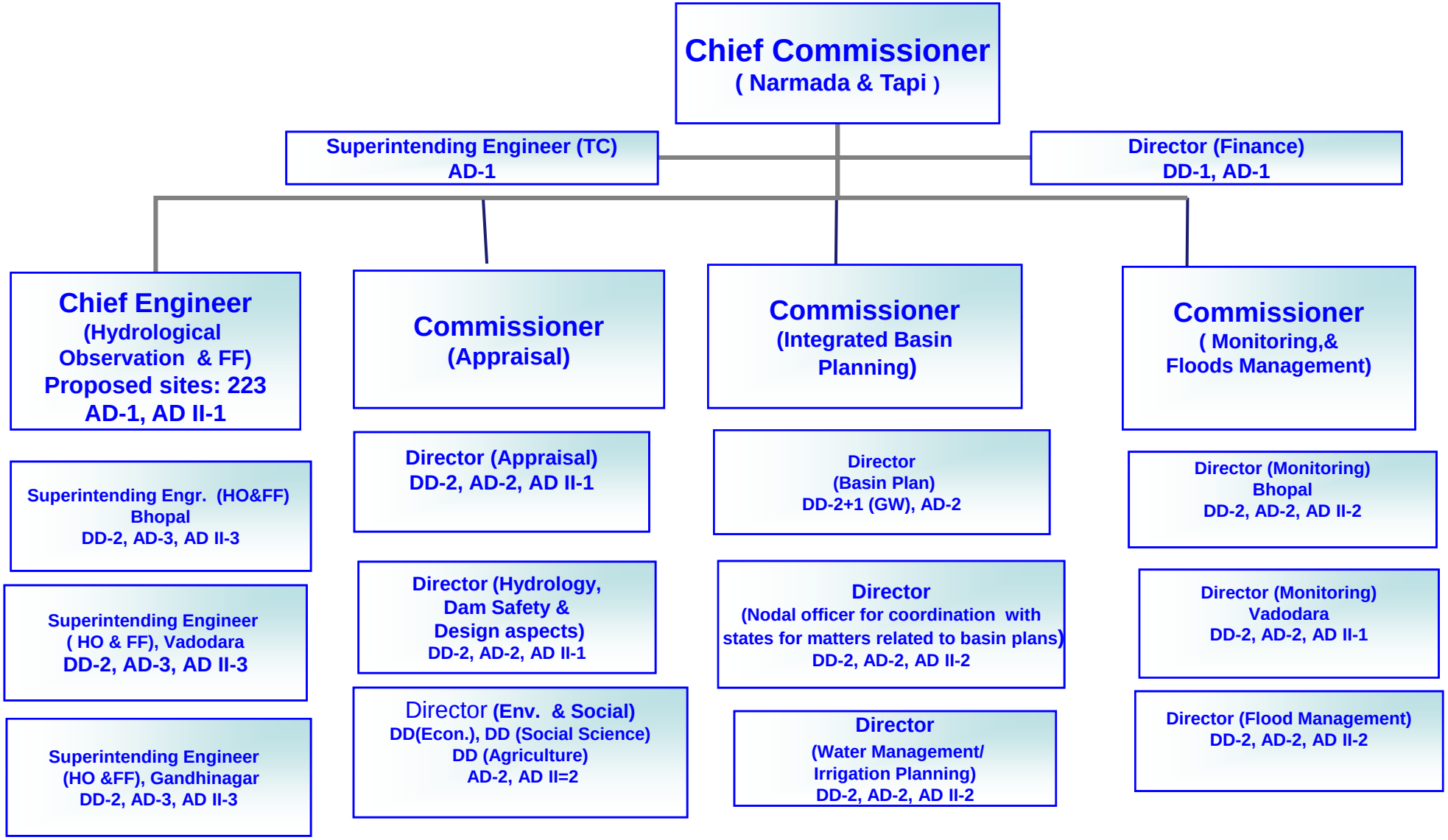
Office of Chief Commissioner (Lower Ganga)



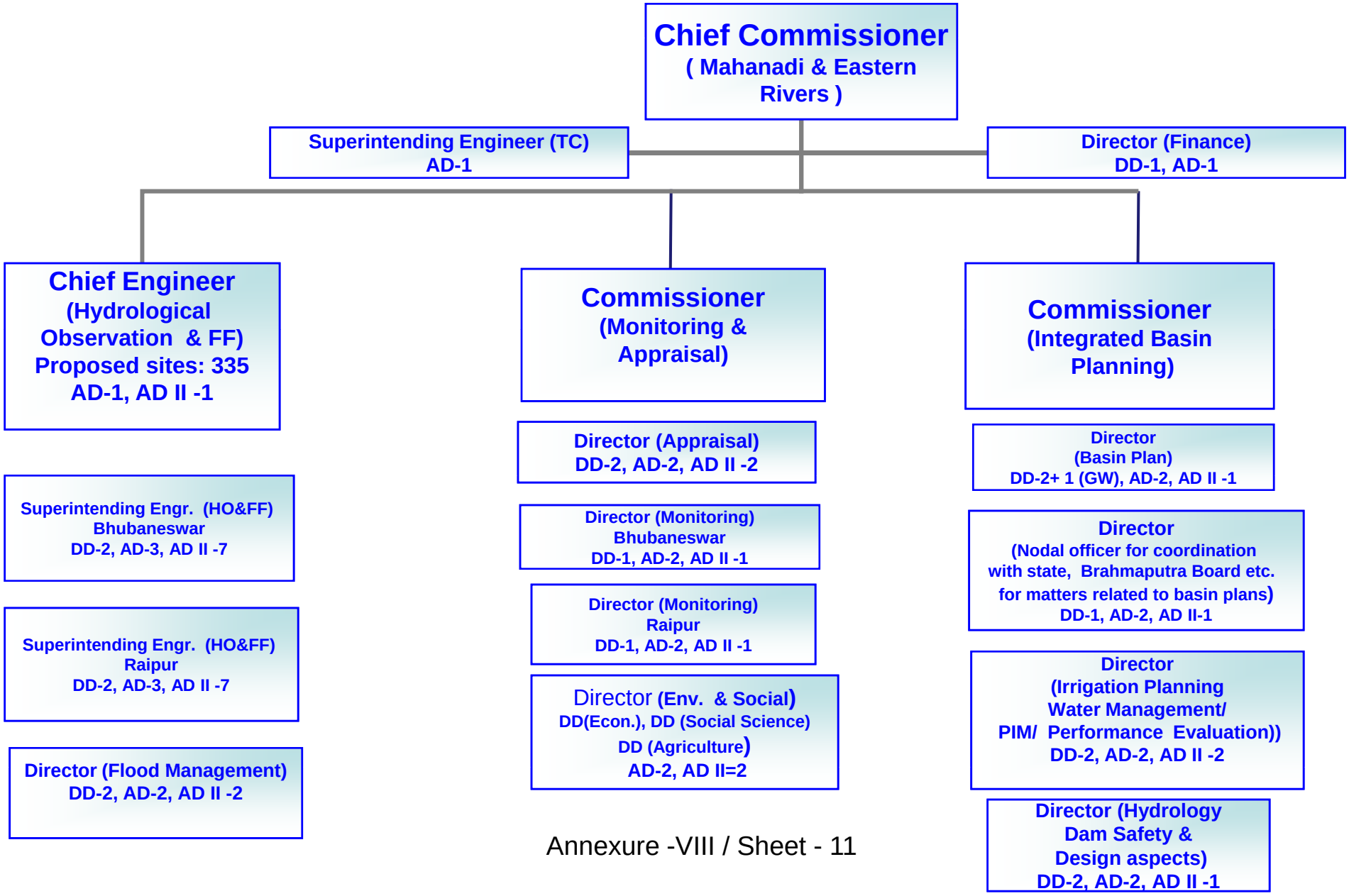
Office of Chief Commissioner (Brahmaputra & Barak)



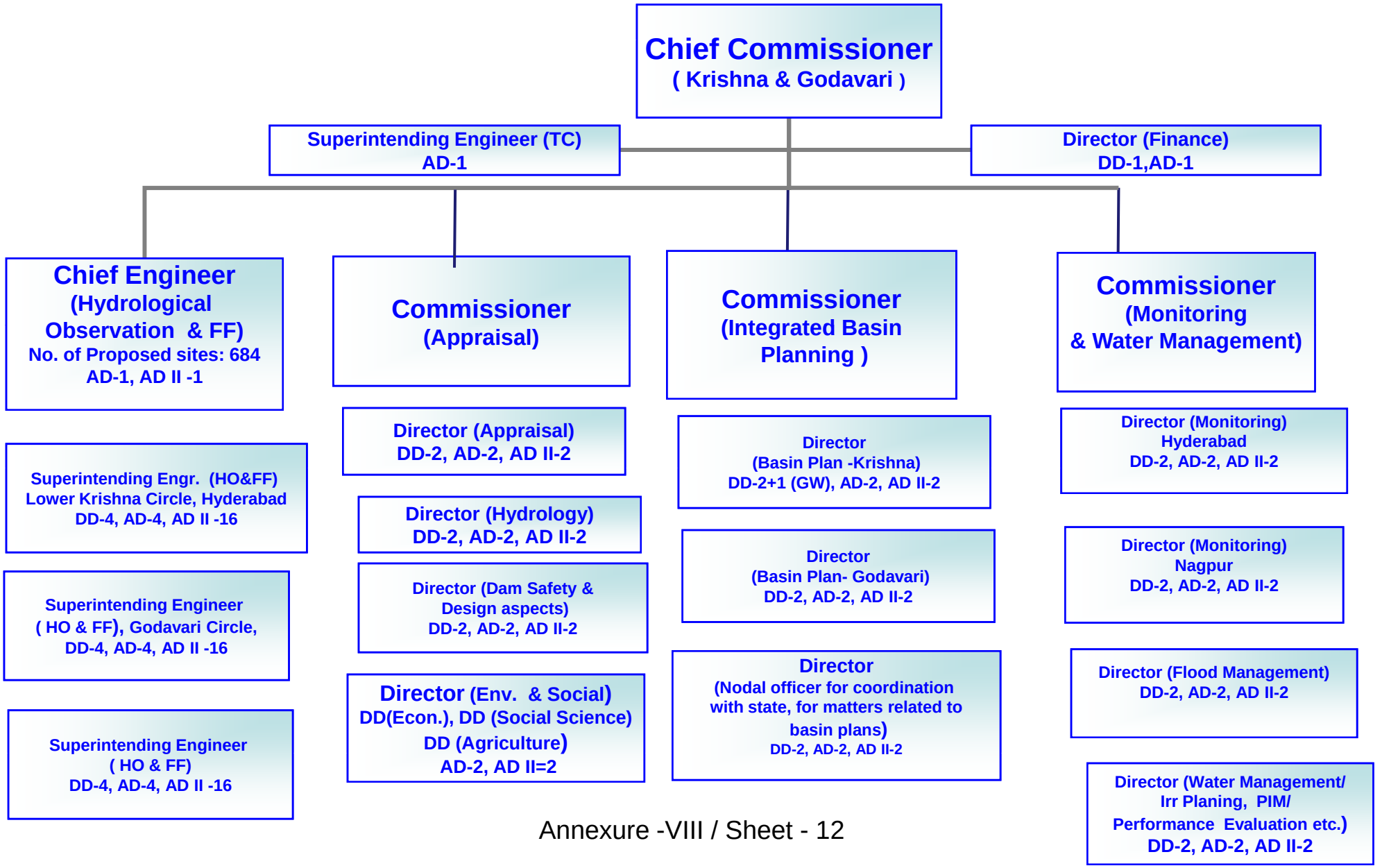
Office of Chief Commissioner (Narmada and Tapi Basin)



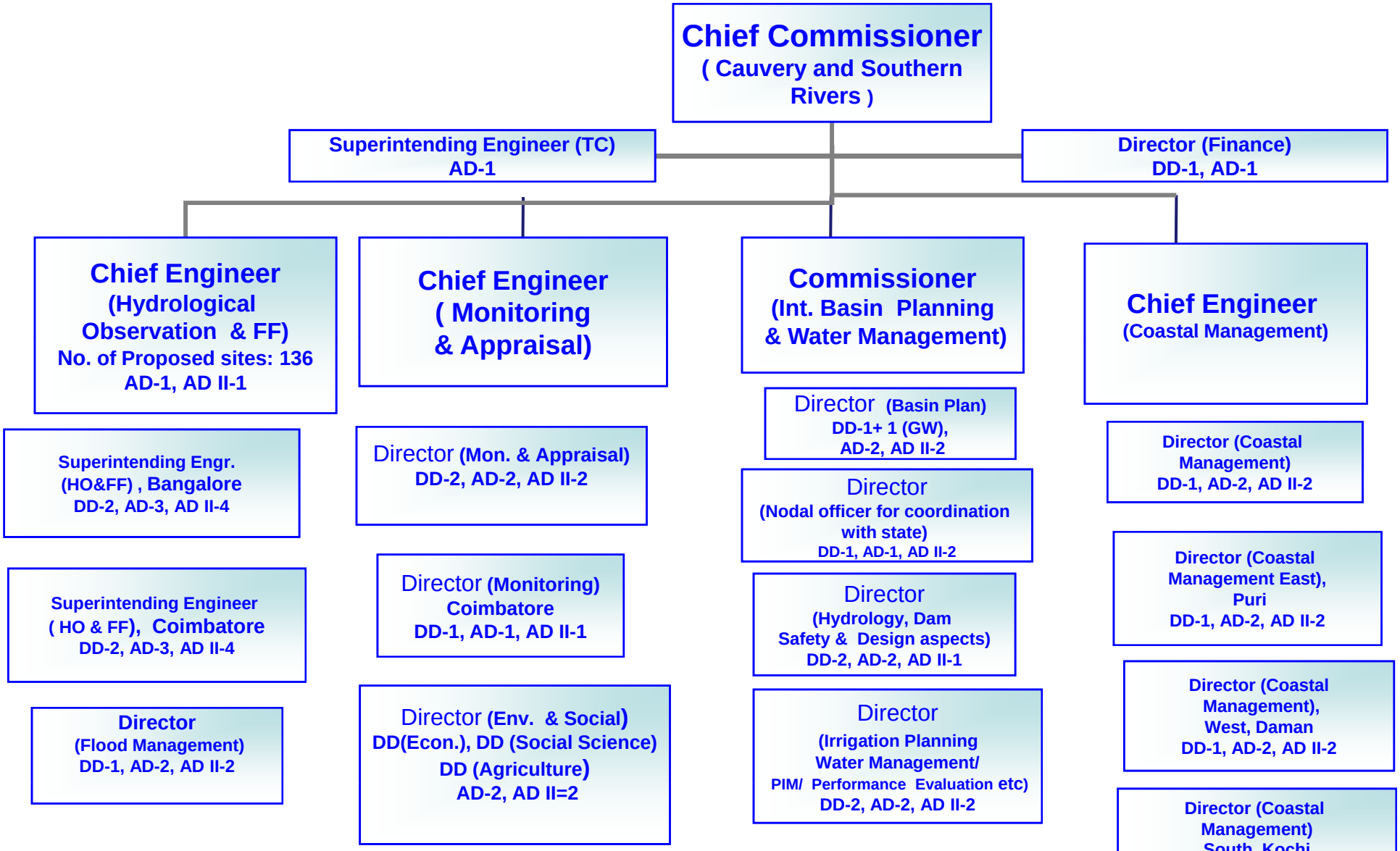
Office of Chief Commissioner (Mahanadi and Eastern Rivers)



Office of Chief Commissioner (Krishna and Godavari)



Office of Chief Commissioner (Cauvery and Southern Rivers)



CWC Engineering and Other Group A, B Posts after restructuring

		Chair-man	VC	Member	CE	Director	DD	AD	AD II	JE
HQ	O/o Cman	1				1				
	VC(N)		1		4	12	12	12	24	
	VC(S)		1		4	12	12	12	24	
	Member Secretary, Commission			1	3+1(Fin)	7+2(Fin)+2 (CSS)+1(IT)	19	19	16	20
	Member (Design)			1	6	27	54	60	60	
	Total-HQ	1	2	2	17+1	59+5	97	103	124	20
FIELD	M(Indus)			1	3	10+1	15+4	20	27	100
	M (Upper Ganga)			1	4	14+2	25+4	39	47	200
	M (Lower Ganga)			1	5	19+2	41+4	43	63	190+5(GFCC)+67(FBP)
	M(Brahmaputra)			1	4	14+2	22+4	33	45	145
	M (Narmada and Tapi)			1	4	12+2	23+4	30	25	110
	M (Mahanadi & Eastern Rivers)			1	3	11+2	18+4	27	28	110
	M(Krishna and Godavari)			1	4	14+2	31+4	39	75	340
	M(Cauvery and Southern Rivers)			1	4	14+2	19+4	31	31	96
	NWA				1	7	15	14	2	2
	Total-field			8	32	115+15	209+32	276	343	1365
	Grand Total	1	2	10	49+1	174+20	306+32	379	467	1385
	Existing Strength	1	-	4	34	148	230	246	318	676

Annex-IX (Para 5.6 of report)

Work Profile at different levels after Restructuring/ Strengthening

Introduction

Central Water Commission is an attached office of Ministry of Water Resources and is headed by Chairman, with the status of Ex-Officio Secretary to the Government of India. Under present set-up, the chairman is assisted by three members with the status of Ex-Officio Additional Secretary to the Government of India each heading a wing.

Under the restructuring/ strengthening plan of CWC, the work of Commission is proposed to be carried out under the overall supervision of Chairman, CWC, supported by two Vice-Chairmen each with the status of Ex-Officio Special Secretary, to look after specific issues facing the country. One of the Vice-Chairmen will be looking after issues pertaining to Ganga basin and International matters while other will be looking after policy issues in the country, water management aspects and handling inter-state issues.

In addition, two Member level officers at Head Quarters will be reporting directly to Chairman CWC. One of them will be Member Secretary, who will be looking after Human Resources development and management issues, financial aspects, IEC activities etc. Another one will be Member (Design) and will be looking after Design activities in the Commission. The Chief Engineer, National Water Academy, Pune will also work under the guidance of Member Secretary, Commission.

Thus, the Commission will consist of the Chairman, two Vice-Chairmen and two Members stationed at Head-Quarters. Regional Offices of CWC would be headed by Chief Commissioners (Member level officer) and In the discharge of their responsibilities, they will be assisted by officers of the rank of Commissioners/ Chief Engineer, Director/Superintending Engineer, Deputy Director/Executive Engineer, Assistant Director/Assistant Executive Engineer and other Engineering and Non-Engineering officers and supporting staff working in the various field organizations.

In addition, Ganga Flood Control Commission and Farakka Barrage Project which are at present sub-ordinate offices of Ministry of Water Resources are proposed to be brought under the control of restructured /strengthened CWC.

Proposed Organogram of CWC is given as Plate-I. The post-wise functions of various offices of restructured /strengthened CWC are described in the following sections.

1.0 Chairman, CWC

The present set-up of Chairman heading the Central Water Commission is proposed to be retained for restructured /strengthened CWC. Chairman, with the status of Ex-Officio Secretary to the Government of India is Head of the Organization and is responsible for overseeing the various activities related to overall planning and development of surface water resources of the country.

A Director level officer will act as Technical PA to Chairman and will provide assistance to Chairman, CWC in technical matters.

Vice-Chairman (1) and Vice Chairman (2)

There will be two Vice-Chairmen each with the status of Ex-Officio Special Secretary, to look after specific issues facing the country. They will also assist Chairman CWC in matters relating to subjects dealt by the Chief Commissioners in the Regional Offices of CWC.

Vice-Chairman (1) will look after all the matters relating to Ganga & Brahmaputra basin as well as Indus basin. These basins / sub-basin are very large in terms of catchment area involved and has number of issues relating to development of water resources in the region, flood problems, etc. International issues are also involved as majority of the rivers are trans-boundary rivers and country has to fulfill obligations for various International treaties/ agreements signed between India and its neighbouring countries.

Vice Chairman (2) will be responsible for looking after specific issues like policy issues in the country, water management aspects and handling inter-state issues etc. With water resource becoming scarce due to increasing demands, falling per capita availability and rising conflicts amongst states and various stakeholders, increasing thrust is being given for water management issues including improving water use efficiency. He will also look after environment and water quality issues which need greater attention.

The Vice-Chairmen will also be responsible for pooling in the experience of different river basins and devising strategies, plans and policies for sustainable development. They will also facilitate Ministry of Water Resources in providing consolidated input for policy planning. Thus, there will be considerable value addition at the level of Vice Chairman.

Each Vice-Chairman will be assisted by four Chief-Engineer level officers at the head quarters. The Chief Engineers under Vice Chairman(1) will be handling

issues related to Projects, Planning, Floods and International matters whereas Chief Engineers under Vice-Chairman(2) will be handling Policy matters, Projects, Floods and Water Management and Environment & Water Quality issues.

For the purpose of administrative control, Chief Commissioners for regional offices in Ganga and Brahmaputra Basin as well as Indus basin will report to Vice-Chairman (1), whereas Chief Commissioner heading other regional offices of CWC i.e. Chief Commissioner (Narmada and Tapi), Chief Commissioner (Mahanadi and Eastern Rivers), Chief Commissioner (Krishna and Godavari), Chief Commissioner (Cauvery and Southern Rivers) will report to Vice-Chairman(2).

Units under Vice Chairman (1) at Head Quarters

Chief Engineer, Planning

- Assist Chairman CWC and Vice-Chairman in planning at basin level and coordinate planning related activities with various basin organizations of CWC.
- Monitoring the status of basin plans to be prepared by basin organizations of CWC and coordination of related matters.
- Promoting solution oriented R&D schemes in water sector.

Chief Engineer (Projects)

- Responsible for all matters related to water resources projects.
- Overall Planning and development of river basins.
- Assisting Advisory Committee in techno-economic appraisal of Major and Medium irrigation, Flood Control and Multipurpose Projects.
- Coordination with Regional Offices of CWC for monitoring status of on-going major, medium & ERM irrigation projects.
- Appraisal of civil component, water availability and inter-state aspects of hydro as well as thermal power project proposals received from Ministry of Power.
- Issues related to national projects and externally assisted projects etc.

Chief Engineer (Floods)

- Matters related to issue of flood forecast on all major flood prone rivers and inflow forecasts for selected important reservoirs.
- Coordination and guidance to Regional Offices of CWC and State

Government concerned in technical matters related to flood management in the country.

- Coordination and cooperation with National Disaster Management Authority for flood related matters.

Chief Engineer (International Matters)

- Matters pertaining to International issues related to water resource sector including flood related matters.
- Three Director level officers will be dealing with international issues with neighbouring countries viz. Pakistan, Nepal & Bhutan and China and Bangladesh.

Units under Vice Chairman (2) at Head Quarters

Chief Engineer, Policy

- Assist Chairman CWC and Vice-Chairman in Policy related matters.
- To provide assistance to National Water Resources Council
- To act as technical secretariat to National Water Board.
- Coordinate Policy matter and related activities with various Regional Offices of CWC.

Chief Engineer (Projects)

- Responsible for all matters related to water resources projects.
- Overall Planning and development of river basins.
- Assisting Advisory Committee in techno-economic appraisal of Major and Medium irrigation, Flood Control and Multipurpose Projects.
- Coordination with Regional Offices of CWC for monitoring status of on-going major, medium & ERM irrigation projects.
- Appraisal of civil component, water availability and inter-state aspects of hydro as well as thermal power project proposals received from Ministry of Power.
- Issues related to national projects and externally assisted projects etc.

Chief Engineer (Floods and Water Management)

- Coordination and guidance to Regional Offices of CWC and State Government concerned in technical matters related to flood management in the country.

- Overall monitoring of coastal data collection, coastal management and anti-erosion activities.
- Promoting participatory irrigation management and Water Management activities.
- Co-ordination with State Government, other departments dealing with water, for its development and management related issues.

Chief Engineer (Environment and Water Quality)

- Matters pertaining to environment issues related to water resource sector.
- Environmental impact assessment (EIA) studies and monitoring of implementation of environmental safeguards in water resources projects,
- Monitoring of water quality parameters of rivers.
- Identification of hot spots and charting out suitable action plans for maintaining water quality and controlling water pollution in the various rivers
- Co-ordination and cooperation with Ministry of Environment and Forests and other the related departments, Water Quality Assessment Authority (WQAA) etc.
- Issues pertaining to Climate change and its impact on water resources.

Member, Designs

Designs wing will be responsible for, providing guidance in the planning, preparation of lay-out studies, specifications, detailed designs and drawings and standardization of designs of river valley projects in the country including hydrological studies for the projects, advising state Governments/Dam owning agencies on safety aspects of dams, taking policy decisions on design and research activities, conducting site inspection at all critical stages of construction of projects for which CWC provides design consultancy for advising the adequacy of foundation conditions and foundation treatment, adherence to design specifications etc. and providing advices on landslide/dam break disaster management issues. The wing will also provide inputs for Survey, investigation and preparation of DPRs of river valley projects in respect of hydrological studies, design & drawings of hydraulic structures.

Design Organisation of CWC will remain in head quarters / Central office and its present structure will be more or less maintained with only a slight reduction in staff strength and redistribution of work. It is essential to preserve and upgrade skills in the design attained by CWC over the years of experience in planning, design and implementation of water resources projects in the country. Further, the design activities cannot be shifted to field keeping in view of specialisation required for each component of water resources sector. Keeping the organisation at one place would require less number of specialists.

Member Designs will be assisted by six Chief Engineer level offices, with three Chief Engineers looking after Design aspects of Water Resources projects, and others looking after Hydrology, Dam Safety and Standardisation aspects.

Chief Engineer (Designs- I, II & III)

There will be three design units each headed by a Chief Engineer level officers, who will be looking after design aspects of projects in different parts of the country. Design units will generally perform the following functions:-

a) Finalisation and approval of detailed designs, drawings, specifications of various river valley projects.

b) Technical examination of projects referred to various directorates working in the D&R Wing.

c) Technical advice to Project/State Authorities in respect of specific issues referred to CWC.

A Design unit will typically comprise of five design directorates whose functions are as under:-

Director, Concrete & Masonry Dam Design

- Designing of gravity dams, sluice and its related components for river valley projects,
- vetting of designs and drawings prepared by other agencies,
- suggesting rehabilitation measures for concrete and masonry dams,
- technical examination of DPR/PFR of major projects in respect of gravity dam component,
- providing solution for special problems of projects
- assisting BIS in preparation and revision of codes for gravity dams and related structures.

Director, Embankment

- Design of earth/rockfill dam, tailing dams and their appurtenant structures, diversion structures and other components of dams,
- technical examination of embankment design aspects of PFR/DPR,
- assisting BIS in the preparation of various Indian Standards pertaining to river valley projects (embankment dams)
- providing solutions to special problems referred by the State Govts. / other agencies.

Director, Hydel Civil Design

- Providing preliminary and detailed design consultancy services for civil design components of various hydro-electric projects,
- evaluation and vetting of specifications, tender documents and related technical aspects of hydro-electric projects,
- attending to special problems of projects,
- technical appraisal of DPR/PFR of various projects of the concerned states in respect of hydropower component
- assisting BIS in preparation of design standards in respect of hydro power components.

Director, Gates

- Preliminary and detailed design consultancy in respect of hydro mechanical structures such as gates, hoists etc.
- preparation of technical specifications, scrutiny of manufacturer's design and drawings
- solution to special problems referred from time to time,
- technical appraisal of major projects
- assisting BIS in preparation of relevant codes.

Chief Engineer, Hydrological Studies

- provide basic input of hydrology for rational planning of water resources projects,
- review design flood studies for various projects,
- technical appraisal of the hydrological aspects of river valley projects,
- consultancy of project hydrology connected with the planning, design and operation of water resources projects
- provide guidance/assistance to various agencies like WAPCOS, NEEPCO, NHPC and State Governments in undertaking hydrological studies,
- imparting training on project hydrology to various Central and State Government's Engineers
- prepare Manuals/Standards for hydrological analysis.

Chief Engineer (Dam Safety Organisation)

- coordinative and advisory role for the State Governments in assisting them to locate causes of potential distress in dams and to recommend measures for their redressal,
- laying down guidelines for dam safety monitoring,
- review of the safety status of dams & instrumentation of dams,
- finalising seismic design parameters for dam designs,
- dam break studies
- Preparation of emergency action plan.

Chief Engineer (Standarisation)

- Assisting Bureau of Indian Standards (BIS) in preparation and revision of IS

codes related to water resources sector.

- Standarisation of design procedures, manuals and documents related to designs.

Member Secretary, Commission

Member Secretary, CWC, an officer of the level of Member, will deal with human resources management & development, financial matters, training and administrative matters of the Central Water Commission. This unit will handle administrative, establishment and personnel service matters such as recruitment/appointments, promotion, transfers, deputation, confirmation, seniority, recruitment rules, disciplinary and vigilance matters, career management of employees of Central Water Commission and training of newly recruited and in-service CWC officers.

Member Secretary of the Commission will be assisted by four Chief Engineer level officers, looking after Human Resource Management, Water Resource Information System and IT aspects, Financial Advisor, and IEC activities.

Chief Engineer (National Water Academy), Pune, which is providing training to in-service officers/ engineers of Central and State Governments, will also report to Member Secretary of the Commission.

Chief Engineer (Human Resource Management)

- human resources management & development, training and administrative matters of the Central Water Commission
- administrative, establishment and personnel service matters such as recruitment/appointments, promotion/ACPs, transfers, deputation, confirmation, seniority, recruitment rules,
- conduct rules, disciplinary and vigilance matters.
- cadre review, career management of employees of Central Water Commission at headquarters (HQ) as well field formations.

Financial Advisor

- Financial Advisor will be officer of rank of Joint Secretary
- Responsible for all matters pertaining to Budget, accounts, expenditure on plan schemes, etc.
- Advise the Commission in all matters relating to the operation of financial and other related rules of the Government.

- To be assisted by Director (Finance) and Assistant Controller of accounts in discharge of his functions.

Chief Engineer (WRIS and IT)

- Procurement of computer hardware and software, including upgradation, networking and internet management, maintaining CWC web site, etc.
- Training manpower in IT aspects in CWC headquarters
- Creation of Water Resources Information system by compiling all the data collected for river basins of his regional office and making the information available (on line).
- Responsible for e-governance initiatives in CWC and interaction with MoWR, NIC, DoPT and other organisations in the matters of e-Governance.

Chief Engineer (IEC Activities)

- Responsible for carrying out activities related to Information, Education and Communication.
- Creating mass awareness about water resources and related aspects,
- Training of Officers and staff of CWC in various aspects of water resources
- Documentation of important technical manuals, design memorandum, specifications etc.

Chief Engineer (National Water Academy), Pune

National Water Academy (earlier named as Central Training Unit) was set up in Central Water Commission in the year 1988, to impart training to the in-service engineers of various Central/State organizations involved in the Development & Management of Water Resources. The NWA is headed by an officer of the rank of Chief Engineer who will now report to the Member Secretary, CWC. The core faculty comprises of CWES (Central Water Engineering Services) officers who have long practical experience in Water Resources Development and Management. The guest faculty comprises of academicians and scientists of eminence from premier Research Centres and Universities in India, as well as practicing professionals and specialists drawn from other organizations and agencies.

The broad functions of NWA will be as under:

- To organise specialised courses for Group `A' and `B' officers of Central and State agencies

- To arrange National/Regional Seminars and Workshops on key issues of water resources development and related subject areas for the benefit of Senior level officers of State/Central agencies.
- To provide assistance to Central and State Government organisations and their training institutes for their specific training needs.
- To develop and maintain linkages with leading institutions in India and abroad dealing with training activities in water resources sector for sharing the expertise.
- To develop training modules/case studies on application of new emerging technology like remote sensing and GIS in water resources.
- To organise Induction Training for newly appointed Assistant Directors/Assistant Executive Engineers of Central Water Engineering (Group 'A') Services.
- To extend training facilities to Engineers from developing countries of Asia and Africa

Functions of Field Offices having similar nomenclature under different regional offices:

Chief Commissioner – Regional Offices of CWC

Head of the Regional Office of CWC – Responsible for overseeing the various activities related to overall planning and development of the river basins. He will assist Chairman, CWC and Vice Chairman in activities relating to water resource development and management in the region in its jurisdiction.

His scope of activities will includes preparation of basin plans, collection of necessary data and related activities for the purpose, techno- economic appraisal of irrigation and multi-purpose projects in the basin, providing technical guidance in matters relating to river morphology, flood management, techno-economic evaluation of flood management schemes, collection of hydrological and hydro-meteorological data, formulation of flood forecast on all major flood prone rivers and inflow forecasts for important reservoirs, safety aspects of major and medium dams, hydrological studies for the projects, investigation of irrigation / hydro-electric / multipurpose projects, monitoring of major and medium projects in the basin, command area development and water management activities, flood management works etc.

He will be assisted by three/ four Commissioner/ Chief Engineers, depending upon size and area of jurisdiction of basin and issues to be addressed in the basin. He will look after all matters relating to Superintendence of work of Commissioners/ Chief Engineers looking after works of Hydrological data collection and Flood forecasting, Monitoring & Appraisal, Integrated Basin Planning and Water Management activities etc.

Chief Engineer (Hydrological Observation & Flood Forecasting)

- Technical guidance for maintaining, expansion and modernisation of hydrological observations network for collection, processing, compilation & storage of hydrological and hydro-meteorological data
- Monitoring of water quality parameters of rivers.
- Issue of flood forecast on all major flood prone rivers and inflow forecasts for selected important reservoirs,
- Surveys, investigations and preparation of DPR for water resources development projects in the country and neighbouring countries falling under their jurisdiction including observation of hydrological data.
- Responsible for implementation of various schemes / works related to flood management and erosion control whenever required in consultation with the states.

Commissioner (Appraisal & Monitoring)

- Techno-economic appraisal of major and medium irrigation, flood control and multi-purpose projects proposed by the State Governments.
- Preparation of TAC notes for putting before the Technical Advisory Committee (TAC) constituted by the MOWR, for recommendation for investment clearance by the Planning Commission.
- Director level officers looking after specialised matters relating to hydrological aspects, irrigation planning and water management aspects, environmental and social aspects will provide support for the appraisal process.
- A Director level officer will be looking after dam safety and design aspects. However, expert advice in design aspects of projects can be obtained from design organisation stationed at Central office (head quarters).
- A multi-disciplinary team of officers in field of economics, agriculture, environment and ground water field will assist in holistic planning.
- Monitoring of on-going major, medium & Extension Renovation & Modernisation (ERM) irrigation projects for identification of bottlenecks to achieve the targeted benefits.

Commissioner (Integrated Basin Planning)

- Promoting Integrated water resource management in the basin
- Water resources availability and demand assessment.
- Preparation of river basin plans for deriving optimum utilisation of water resources through multi-disciplinary system approach considering river basin as a unit for water planning in consultation with concerned states.
- Maintenance and updating of Water Resources Information system by compiling all the data collected for river basins of his regional office
- Addressing inter-state issues / concerns
- Providing support for international issues to Central Office/ MoWR

Commissioner (Water Management & Flood Management)

- Promoting participatory irrigation management in the basin, mass awareness and education of local masses.
- Co-ordination with State Government, stake holders like, NGO's, Beneficiaries on water resources development and management related issues.
- Irrigation planning and assisting States in soil conservation, anti-water-logging measures and water management in the basin,

- Review of performance of existing projects,
- Monitoring safety aspects of dams in the basin.
- floods & disaster management issues, morphology studies of rivers in the basin.
- Integrated operation of reservoirs (Interstate as well as within State) which will help in Flood Management & Water Management.

Chief Engineer (Coastal Management)

- Will function under the control of Member (Cauvery and Southern rivers organisation) and will be looking after coastal management issues for the entire country.
- Collection and compilation of hydro-meteorological, coastal and tidal data.
- Providing advice to coastal states on issues related to coastal erosion,
- Help in formulation, planning and implementation of works for coastal protection etc.
- Director level officers will be looking after field data collection for coastal management in the eastern, western and southern parts of country having coastal boundaries.

Directors/ Superintending Engineers

Superintending Engineer (Coordination)

Superintending Engineer (Coordination) assists Chief Engineer in technical, financial and administrative matters, collects, compile and submits information requested by CWC/MoWR, coordinates with the State Governments in obtaining the required information or to pursue the State Governments to furnish the material on various issues as desired by CWC/MoWR.

Superintending Engineers, Hydrological Observation Circles

Superintending Engineers, Hydrological Observation Circles are responsible for, carrying out hydrological observations (Gauge, Discharge, Sediment & Water Quality) with a network of river observation stations; processing, storage & retrieval of hydrological data; publishing the data so collected in the form of Water Year Books, Sediment Year Books and Water Quality Year Books and formulation and dissemination of flood forecasts to the local authorities in their jurisdiction. Superintending Engineers, Hydrological Observation Circles are assisted by EE (Divisions), AEE/AE (Sub-Divisions) and other officers and staff.

He will also be responsible for implementation of various schemes / works related to flood management and erosion control whenever required in consultation with

the states.

Director (Monitoring)

Director (Monitoring) is responsible for, the works relating to monitoring of schemes under general monitoring, AIBP, CAD Programme, *Flood management schemes* and restoration of water bodies in the concerned States under their jurisdiction for on the spot study of the physical progress, bottlenecks and suggests remedial measures to project authorities/ State government for speedy completion of projects and preparation of status report and quarterly progress report of monitored projects.

Director (Appraisal) / Director (Monitoring and Appraisal)

Director (Appraisal) is responsible for appraisal of major and medium Irrigation projects, *Flood management schemes,* for the states under their jurisdiction. He will be assisted by other Directors in the basin organisation looking after specific works such as hydrology, environment and social aspects, irrigation planning, water management, dam safety and design aspects etc. He will also be assisted by Design Organisation stationed at CWC head quarters/ central office for examination of design aspects of the projects.

Director (Integrated Basin Planning)

He will be responsible for Integrated Basin Planning, preparation of Comprehensive Flood Management plans, action plan for flood management, development of Decision Support system for the water use management and Flood management will be taken up CWC(HQ), However this decision support system will be put to use and scenarios generated for efficient water management can be disseminated to stake holders by Director (Systems). Mass awareness and education of local masses. He will be responsible for Preparation of flood maps/flood plain zoning and lean flow estimation and forecasting (Draught Studies)

Director (Dam Safety & Design aspects)

He will look after the Dam safety Monitoring aspects and Coordination with headquarters. He will also look after design aspects and provide assistance in appraisal of the projects in the basin.

Director (Environment & Social)

He will look after the Social and Environmental aspects of the projects in the basin. He will preferably be expert in field of environment and social aspects and

may be taken on deputation from other departments and academic institutions. He will have a multidisciplinary team of deputy director level officers from field of Economics, agriculture, environment and social to look after various aspects of projects.

Director (Hydrology)

He will be entrusted with the work of technical appraisal of hydrological aspects like water availability, design flood, sedimentation, diversion flood of water resources projects in the basin and providing guidance/assistance to Project Authorities and State Water Resources Departments in undertaking hydrological studies.

Director (Irrigation Planning and Water Management)

He will be responsible for carrying out technical scrutiny/appraisal of basic planning and irrigation planning aspects including economic viability of major irrigation and multipurpose water resources development projects irrigation planning including crop water requirements and water availability aspects of irrigation projects and providing inputs for preparation of basin plans, looking after water management aspects, , monitoring of reservoir storage position of important reservoirs in the basin, etc. He will also be responsible for performance evaluation of existing projects and formulation of guidelines for future reference of project planning and Suggestions/ remedial measures for improvements of existing projects.

Director (Nodal Officer)

He will be responsible collection and compiling data required for preparation of basin plans from Central Govt. departments State Government, various other sources and agencies involved in water resource development and management, stake-holders and water users etc. He will also assist in creation and up-dation of Water Resources Information system by and making the information available to CWC Central office.

He will look after the aspects of Water resources assessment, addressing international concerns and input to MOWR, He will provide policy analysis and technical support for conflict resolution. He will play a role as assessor and Policy analysis for water allocation.

Director (Floods and Disaster Management)

He will be responsible for looking after flood management aspects in the basin, river morphology studies, techno-economic appraisal of various flood management projects and multipurpose projects having flood management

aspects, providing inputs related to floods disaster management etc.
He will look after Analysis of Reservoir data and preparing guidelines for integrated operation of reservoirs (Interstate as well as within State) which will help in Flood Management & Water Management. *He will also be responsible for carrying out study of impact of climate changes on flow variations in rivers, collection, and compilation key climate variables, e.g. temperature, precipitation, humidity, etc. to study their long-term implications for the quality and quantity of water, collection and compilation of flood prone area, flood damage data and other related data in a realistic and scientific manner.*

Superintending Engineers, Investigation Circles

Superintending Engineers, Investigation Circles are responsible for, surveys, investigations and preparation of DPR for water resources development projects in the country and neighbouring countries falling under their jurisdiction including observation of hydrological data. Superintending Engineers, Investigation Circles are assisted by EE (Divisions), AEE/AE (Sub-Divisions) and other officers and staff.

S. No.	Name of Basin Offices proposed under Restructuring of CWC	Existing Sites	Proposed Sites
1.	Indus Basin Organisation	36	298
2.	Upper Ganga Basin Organisation (including Yamuna basin)	174	429
3.	Lower Ganga Basin Organisation (including GFCC & FBP)	111	430
4.	Brahmaputra Basin Organisation (including Barak & Teesta basin)	163	259
5.	Narmada and Tapi Basin Organisation (including west flowing rivers in the region)	99	223
6.	Mahanadi and Eastern Rivers Basin Organisation	73	335
7.	Krishna and Godavari Basin Organisation	125	684
8.	Cauvery and Southern Rivers Basin Organisation	97	136
	Total	878	2794