

Subject: Identification of basins for formulation of flood forecast in uncovered basins in Himalayan region and for inflow forecasting for inter-state projects by Central Water Commission – regarding.

Reference: Chairman's Note dated 9th September 2014

During the year 2014, severe flood was witnessed in Jammu & Kashmir during the period 3rd to 9th September 2014. During this period lot of queries were asked about the present water level and the forecast of water levels. Since J&K was not in the list of flood forecasting, no information about real –time water levels were available with Central Flood Control Room (CFCR). This was commented upon by media also.

In order to meet the expectations of the Government of India and other State Governments as well as to improve the early warning for such type of severe floods in uncovered regions of the country, Chairman CWC vide his note under reference has suggested identification of uncovered basins especially in Himalayan regions as well as for inflow warnings to inter-state rivers which do not have the forecasting arrangement presently. He has also suggested the coordination between D&R wing and RM wing in development of unit hydrographs based on rainfall forecasts issued by IMD.

A meeting was held in the Chamber of Director (RMCD) on 11th September 2014 to discuss the above note. It was attended by the Directors from FCA, FFM, Hydrology (C) and Hydrology (N) alongwith their Ads and DDs.

In the meeting it was decided to identify the reaches for which flood forecast formulation can be done. Accordingly, the following reach of rivers is being identified.

1. Jhelum upto Srinagar
2. Chenab to Akhnoor
3. Sutlej upto Rampur
4. Yamuna upto Hathnikund Barrage
5. Bhagirathi upto Tehri Dam
6. Alaknanda upto Devprayag
7. Ramganga upto Kalagarh Dam
8. Sharda upto Sharda Barrage
9. Ghaghra upto B K Ghat
10. Rapti upto Kakardhari
11. Gandak upto Triveni
12. Bagmati upto Bagmati Barrage
13. Kosi upto Kosi barrage
14. Teesta upto Domohani
15. Manas/ Beki upto Mathanguri

16. Pagladiya upto Matunga
17. Puthimari upto DRF
18. Dhansiri (North) upto N H Road Crossing
19. Jia- Bharali upto Bhalukpong
20. Subansiri upto Lower Subansiri Project
21. Siang upto Passighat
22. Lohit upto Tezu.
23. Cauvery upto Mettur Dam for inter-state rivers.

Data availability

CWC is conducting Hydrological Observation at most of the basins.

Jhelum basin

5 HO Stations namely., Nunwan on Lidder, Khanabal, Sangam, Ram Munshi Bagh and Safapora on Jhelum, with a minimum catchment area of 500 sq.km to maximum of 4000 sq.km is available. Data is available for most of the stations from 2002 onwards. All the 5 stations are G&D stations and cross-sections may be available for pre and post monsoons as well as a stable rating curve for boundary station. Rain gauge is available at Nunwan, Ram Munshi Bagh, Sangam Safapora and Karalpora, Kokarnag. Details of Stations are given in Annexure-1

Chenab Basin

13 HO Stations namely Miyar Nallah on Miyar Nallah, Ghousal on Chandra, Tandi on Bhaga, Udaipur on Chandra all in HP, Ujh Dam site and Ujh Power House site on Ujh, Sirshi on Marusudar, Jammu Tawi on Tawi, Gulabgarh, Kidur, Premnagar, Dhamkund and Akhnoor on Chenab in J&K, with minimum catchment area of 860 sq.km to 21600 sq.km is available. Data is available from 1976 for most of the stations. 10 stations are G&D and 2 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations. Rain gauge is available at Tandi, Udaipur, Sirshi, Gulabgarh, Dhamkund Salal, Nandan, Mohu, Banihal, Batote, Rot, Khilleni, Bhaderwah, Kishtwar, Ohli, Mou, Hawal, Sohal, Drabshalla, Bhakta, Koksar, Keylong Ramban and Akhnoor. Details of Stations are given in Annexure-1.

Sutlej Basin

7 HO Stations namely., Pandowa, Powari, Rampur, Natpha and Titang on Satluj and Chumar and Sumdo on Parechu, is available in India and one station Tsada in China. Data is available from 2008 for most of the stations. 3 stations are G&D and 4 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations. Rain Gauge is available in two stations namely Powari and Rampur. Tsada in China also has Rain gauge observations.

Yamuna Basin

9 HO Stations Namely Jateon Barrage on Giri, Yashwant Nagar on Giri, Haripur on Tons, Tuini Pabar on Pabar, Tuini on Tons, Bausan, Naugaon, Paonta and Hathnikund Barrage on Yamuna is available with minimum catchment area of 800 sq.km to 12,000 sq.km. Data is available from 1985 for most of the stations. 7 stations are G&D and 2 are only gauge. Pre and Post monsoon cross-sections may be available for all G&D stations. All the HO Stations have Raingauges.

Bhagirathi

1 HO Station namely Uttarkasi is available with minimum catchment area of 4500 sq.km. Data is available from 1971. The station is G&D. Pre and Post monsoon cross-sections may be available for all G&D stations. Raingauge stations are available at Uttarkasi and Koteshwar in this reach.

Alaknanda

8 HO Stations namely, Karanprayag, Nandkeshri on Pinder, Ganganagar, and Rudraprayag on Mandakini, Bhadrinath, Joshimath, Rudra Prayag and Srinagar on Alaknanda is available with minimum catchment area of 1200 sq.km to 12000 sq.km. Data is available from 1986 for most of the stations. 5 stations are G&D and 3 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations. Raingauges are available at all 8 HO Stations.

Ramganga

1 Gauge Station namely Bhikiasen is available with minimum catchment area of 1625 sq.km. Data is available from 1984. The station is G only. Pre and Post monsoon cross-sections may not be available since site is not G&D station. Raingauge is available at Bhikiasen and Kalagarh.

Sharda

7 HO Stations namely Tawaghat, Jauljibi, Ghat, Pancheswar, Banbasa, Paliakalan and Shardanagar is available with minimum catchment area of 1200 sq.km to 18500 sq.km. Data is available from 1986 for most of the stations. 4 stations are G&D and 3 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations. Raingauge is available at Banbasa, Pancheswar, Paliakalan and Shardanagar.

Ghaghra

5 HO stations are available in Nepal namely Chisapani, Samijighat, Asraghat, Dipayal and Jamu. 1 station namely Chisapani is G&D and remaining are gauge station. Data for G&D station is available from 2010 onwards. Cross sections may be available with Department of Hydrology and Meteorology, Government of Nepal. Rainfall

station is available at Chisapani, Samijghat, Jajerket, Daileku, Asraghat, Dipayal, Mangalsen.

Rapti

5 HO stations namely Babi at Chepang, Badhabridge, West Rapti at Kusum, Mari at Nayagaon, Jhimrul at Cherneta are available in Nepal. West Rapti at Kusum is G&D and remaining are G only. Rainfall is available at Chepang, Gularia, Tulsipur, Gorahi, Rampur Kalimati, Ranijaruwa, Salyan Bazar, Luvamjuyula, Tharmare, Jyamire, Padampur, Ambapur, Ratmata, Kusum, Bagasoti, Nayagaon, Cherneta, Nepalgunj, Dhakeri, Lamahi, Bijuwartar, Libanggaon, Sulichour, Swargadwari, Jalkundi inside Nepal. Some of the station data is available from 2010.

Gandak

Bagmati

and Kosi

HO Stations are available in Nepal and data has to be collected from Nepal Department of Hydrology and Meteorology. Pre and Post monsoon cross-sections may be available for all G&D stations.

Tista

19 HO Stations is available with minimum catchment area of 165 sq.km to 9500 sq.km. Data is available from 2000 for most of the stations. 10 stations are G&D and 9 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations.

Manas, Beki, Pagladiya, Puthimari, Dhansiri (North)

HO Stations are available in Bhutan and data has to be collected from Bhutan. Pre and Post monsoon cross-sections may be available for all G&D stations.

Jia-Bharali

3 HO Stations is available with minimum catchment area of 4500 sq.km to 10000 sq.km. Data is available from 1990 for most of the stations. 1 station is G&D and 2 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations.

Siang

4 HO Stations is available with minimum catchment area of 4500 sq.km to 305000 sq.km. Data is available from 2006 for most of the stations. 2 stations are G&D and 2 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations.

Lohit

4 HO Stations is available with minimum catchment area of 2500 sq.km to 25000 sq.km. Data is available from 2006 for most of the stations. 1 stations is G&D and 3 are Gauge only stations. Pre and Post monsoon cross-sections may be available for all G&D stations.

Cauvery

15 HO Stations is available with minimum catchment area of 700 sq.km to 25000 sq.km. Data is available from 1980 for most of the stations. All stations are G&D. Pre and Post monsoon cross-sections may be available for all G&D stations.

Real –time Rainfall in catchment areas of all these rivers can be taken from respective Basin States if they are maintaining rain gauge as well as from IMD Meteorological centres concerned or AWS website of IMD if the site is connected by AWS or ARG or gridded rainfall from IMD and forecasts for 3 days also can be taken from IMD by two models namely WRF-ARW and MME products.

This is for your kind information and further necessary action, please.

(विष्णु देव राय / Vishnu Deo Roy)
निदेशक (एफ एफ एम) / Director (FFM)

Jhelum

S. No	Name of Site	State	District	HO/FF/HOI/W	Catchment Area SqKm	River Basin	Sub Basin	River Name/ Tributary / Sub Tributary	Type	Observation	Date of Start	Latitude	Longitude
1	Nunwan	J&K	Anantnag	HO/FF	585	Indus	Jhelum	Jhelum/Lidder	GD	GD	01/10/1989 2004	34°01'01"	75°18'48"
2	Khanabal	J&K	Anantnag	HO/FF	1290	Indus	Jhelum	Jhelum	GD	GD	07/12/1991 01/04/1992- 21/08/2003	33°44'55"	75°07'18"
3	Sangam	J&K	Anantnag	HO/FF	3094	Indus	Jhelum	Jhelum	GDO	GDQ	10/09/1989 15/09/1989 10/07/2001 Observation was closed during Militancy period Re started from 26/05/2003	33°49'59"	75°03'58"
4	Ram Munshi Bagh	J&K	Sirnagar	HO/FF	3994	Indus	Jhelum	Jhelum	GDO	GDQ	23/10/1989 23/10/1989 10/07/2001	34°03'47"	74°50'04"
5	Safapora	J&K	Baramulla	HO/FF	-	Indus	Jhelum	Jhelum	GDO	GDQ	16/05/2001 11/03/2002 11/03/2002	34°17'44"	74°37'29"

Chenab

S. No.	Name of Site	State	District	HO/F F/ HOIW	Catchment Area SqKm	River Basin	Sub Basin	River Name/Tributary/ SubTributary	Type	Observation	Date of Start	Latitude	Longitude
1	Miyar Nala	HP	Lahaul Spiti	HO	860	Indus	Chenab	Chenab/Miyar Nala	GD	G D	07/08/1965 01/09/1992	32°42'00"	76°40'57"
2	Tandi	HP	Lahaul Spiti	HO	1530	Indus	Chenab	Chenab/Bhaga	GDSQ	G D S Q	21/08/1972 21/08/1972 09/06/1977 01/07/2000	32°33'00"	76°58'33"
3	Ghousal	HP	Lahaul Spiti	HO	2490	Indus	Chenab	Chenab/Chandra	GDS	G D S	20/08/1972 20/08/1972 11/11/1977	32°33'13"	76°58'16"
4	Udaipur	HP	Lahaul Spiti	HO	5764	Indus	Chenab	Chenab/Chandra	GDSQ	G D S Q	01/01/1974 01/01/1974 01/07/2000 01/01/2003	32°43'00"	76°40'03"
5	Sirshi	J&K	Kishtwar	HO	3335	Indus	Chenab	Chenab/Marus udar	G	G	18/09/1961	33°29'59"	75°51'08"
6	Ujh Dam Site	J&K	Kathua	HOIW	854	Indus	Chenab	Ujh	GD	G D	09/10/2009 09/10/2009	32°33'47"	75°29'19"
7	Ujh Power House	J&K	Kathua	HOIW	880	Indus	Chenab	Ujh	G	G	01/10/2010	32°32'58"	75°27'30"
8	Gulabgarh	J&K	Kishtwar	HOIW	8530	Indus	Chenab	Chenab	GDS	G D S	01/07/1990 01/07/1990 01/07/1990	33°16'12"	76°09'36"
9	Kidur	J&K	Kishtwar	HOIW	9987	Indus	Chenab	Chenab	G	G	24/03/1991	33°18'41"	76°04'37"

S. No.	Name of Site	State	District	HO/F F/ HOIW	Catchment Area SqKm	River Basin	Sub Basin	River Name/Tributary/ SubTributary	Type	Observation	Date of Start	Latitude	Longitude
10	Prem Nagar	J&K	Doda	HO	15490	Indus	Chenab	Chenab	GDSQ	G D S Q	27/11/1967 27/11/1967 27/11/1967 11/03/2002	34°03'47"	74°50'04"
11	Dhamkund	J&K	Ramban	HO	18750	Indus	Chenab	Chenab	GDSQ	G D S Q	01/07/1961 01/07/1964 01/06/1964 21/04/2002	30°14'35"	75°08'45"
12	Jammu Tawi	J&K	Jammu	HO	2168	Indus	Chenab	Chenab/Tawi	GDSQ	G D S Q	01/11/1976 01/11/1976 01/11/1976 11/10/1999	32°43'27"	74°52'15"
13	Akhnoor	J&K	Jammu	HO	21808	Indus	Chenab	Chenab	GDSQ	G D S Q	23/11/1969 23/11/1969 11/02/1971 18/08/1999	32°53'32"	74°44'16"

Satluj

S. No.	Name of Site	State	District	HO/FF/HOIW	Catchment Area SqKm	River Basin	Sub Basin	River Name/Tributary/SubTributary	Type	Observation	Date of Start	Latitude	Longitude
1	Nathpa	Himachal Pradesh	Kinnaur	HO		Indus Basin	Satluj Basin	Satluj	G	G	14/07/2005	31°33'51"	77°58'48"
2	Pandowa	Himachal Pradesh	Shimla	HO		Indus Basin	Satluj Basin	Satluj	GD	G D	05/06/2008 11/07/2008	31°16'00"	77°17'17"
3	Powari	Himachal Pradesh	Kinnaur	HO		Indus Basin	Satluj Basin	Satluj	GD	G D	25/05/2006 01/07/2006	31°32'00"	78°17'00"
4	Rampur	Himachal Pradesh	Shimla	HO		Indus Basin	Satluj Basin	Satluj	GD	G D	19/07/2004 14/07/2006	31°27'05"	77°37'52"
5	Titang	Himachal Pradesh	Kinnaur	HO		Indus Basin	Satluj Basin	Satluj	G	G	21/05/2006	31°46'01"	78°38'11"
6	Sumdo	Himachal Pradesh	Kinnaur	HO		Indus Basin	Satluj Basin	Parechu	G	G	01/05/2005	32°03'00"	78°32'00"
7	Chumar	Himachal Pradesh	Leh	HO		Indus Basin	Satluj Basin	Parechu	G	G	10/06/2005	32°39'00"	78°35'00"

Yamuna

S. No.	Name of Site	State	District	HO/FF / HOIW	Catchment Area SqKm	River Name/Tributory / SubTributory	Type	Observation	Date of Start	Latitude	Longitude
1	Yashwant Nagar	Himachal Pradesh	Simaur	HO	1349	Ganga/Yamuna/ Giri	GDQ	G D Q	28/05/1976 28/05/1976 28/05/1978	30°53'12"	77°12'22"
2	Jateon Barrage	Himachal Pradesh	Simaur	FF	2344	Ganga/Yamuna/ Giri	G	G	1978	30°35'22"	77°29'02"
3	Bausan	Uttarakhand	Dehradun	HO/FF	2075	Ganga/Yamuna	GD	G D	01/10/1981 01/08/1985	30°30'56"	77°55'42"
4	Haripur	Uttarakhand	Dehradun	HO/FF	5056	Ganga/Yamuna/ Tons	GD	G D	17/07/1985 07/08/1985	30°31'34"	77°51'08"
5	Naugaon	Uttarakhand	Uttarakashi	HO/FF	794	Ganga/Yamuna	GD	G D	19/11/1981 19/11/1981	30°47'30"	78°08'07"
6	Tuini (P)	Uttarakhand	Dehradun	HO	1406	Ganga/Yamuna/ Pabar	GD	G D	01/06/1976 03/06/1976	30°57'37"	77°51'13"
7	Tuini (Tons)	Uttarakhand	Dehradun	HO/FF	3362	Ganga/Yamuna/ Tons	GDQ	G D Q	31/05/1976 31/05/1976 31/05/1978	30°56'23"	77°50'48'
8	Paonata	Himachal Pradesh	Simaur	HO/FF	10769	Ganga/Yamuna	GDQ	G D Q	16/10/1978 11/11/1978 31/05/1978	30°25'31"	77°35'31"
9	Hathnikund Barrage	Haryana	Yamunana gar	FF	11197	Ganga/Yamuna	G	G	20/05/1976	30°18'51"	77°35'06"

Bhagirathi

S. No.	Name of Site	State	District	HO/FF/HOIW	Catchment Area SqKm	River Name/Tributary/ Sub Tributary	Type	Observation	Date of Start	Latitude	Longitude
1	Uttarkashi	Uttarakhand	Uttarkashi	HO	4555	Ganga/Bhagirathi	GDSQ	G D S Q	15/07/1971 15/07/1971 12/06/1989 01/06/1989	30°44'20"	78°21'23"

Alaknanda

S. No.	Name of Site	State	District	HO/FF/ HOIW	Catchment Area SqKm	River Name/Tributary/ SubTributary	Type	Observation	Date of Start	Latitude	Longitude
1	Badrinath	Uttarakhand	Chamoli	HO	1285	Ganga/Alaknanda	GD	G D	10/09/1976 24/09/1976	30°46'15"	79°29'40"
2	Joshimath	Uttarakhand	Chamoli	HO	4508	Ganga/Alaknanda	GD	G D	23/04/1971 01/05/1971	30°33'54"	79°33'40"
3	Nandkeshri	Uttarakhand	Chamoli	FF	1296	Ganga/Alaknanda/Pinder	G	G	20/04/1981	30°50'06"	79°29'50"
4	Karanprayag	Uttarakhand	Chamoli	HO	2294	Ganga/Alaknanda/Pinder	GD	G D	10/06/1976 10/06/1976	30°15'20"	79°13'16"
5	Ganganagar	Uttarakhand	Rudraprayag	FF	1350	Ganga/Alaknanda/Mandakini	G	G	10/15/2013	30°25'51"	79°04'09"
6	Rudraprayag (M)	Uttarakhand	Rudraprayag	HO	1644	Ganga/Alaknanda/Mandakini	GDS	G D S	09/02/1971 09/02/1971 06/07/1992	30°17'15"	78°59'04"
7	Rudraprayag (A)	Uttarakhand	Rudraprayag	HO	9031	Ganga/Alaknanda	GDSQ	G D S Q	09/02/1971 09/02/1971 06/07/1992 15/05/1976		78°58'47"
8	Srinagar	Uttarakhand	Pauri	FF	11332	Ganga/Alaknanda	G	G	06/06/1973	30°13'33"	78°46'32"

Ramganga

S. No.	Name of Site	State	District	HO/FF/HOIW	Catchment Area SqKm	River Name/Tributary/SubTributary	Type	Observation	Date of Start	Latitude	Longitude
1	Bhikiasen	Uttarakhand	Almora	HO	1625	Ganga/Ramganga	G	G	23/11/1984	29°41'50"	79°15'39"

Sharda

S. No	Name of Site	State	District	HO/FF / HOIW	Catchment Area SqKm	River Name/Tributary / SubTributary	Type	Observation	Date of Start	Latitude	Longitude
1	Tawaghat	Uttarakhand	Pithoragarh	HO	1225	Ganga/Ghaghra /Sharda/Dhauliganga	GD	G D	23/11/1976 23/11/1976	29°56'00"	80°34'48"
2	Jauljibi	Uttarakhand	Pithoragarh	HO	2150	Ganga/Ghaghra /Sharda/Gauriganga	GD	G D	16/06/1976 16/06/1976	29°45'00"	80°22'00"
3	Ghat	Uttarakhand	Pithoragarh	HO	3900	Ganga/Ghaghra /Sharda/Sarju	GDQ	G D Q	17/11/1976 17/11/1976 01/05/2006	29°30'00"	80°07'40"
4	Pancheswar	Uttarakhand	Champawat	FF	12293	Ganga/Ghaghra /Sharda	G	G	01/06/1976	29°26'24"	80°14'40"
5	Banbasa	Uttarakhand	Champawat	FF	15820	Ganga/Ghaghra /Sharda	G	G	15/07/1974	28°59'57"	80°06'32"
6	Paliakalan	Uttar Pradesh	Lakhimpur Kheri	HO/FF	17676	Ganga/Ghaghra /Sharda	GDSQ	G D S Q	15/04/1959 24/04/1959 26/06/1961 08/01/1964	28°23'00"	80°33'09"
7	Shardanagar	Uttar Pradesh	Lakhimpur Kheri	FF	18553	Ganga/Ghaghra /Sharda	G	G	21/07/1969	28°09'41"	80°47'53"

Ghaghra