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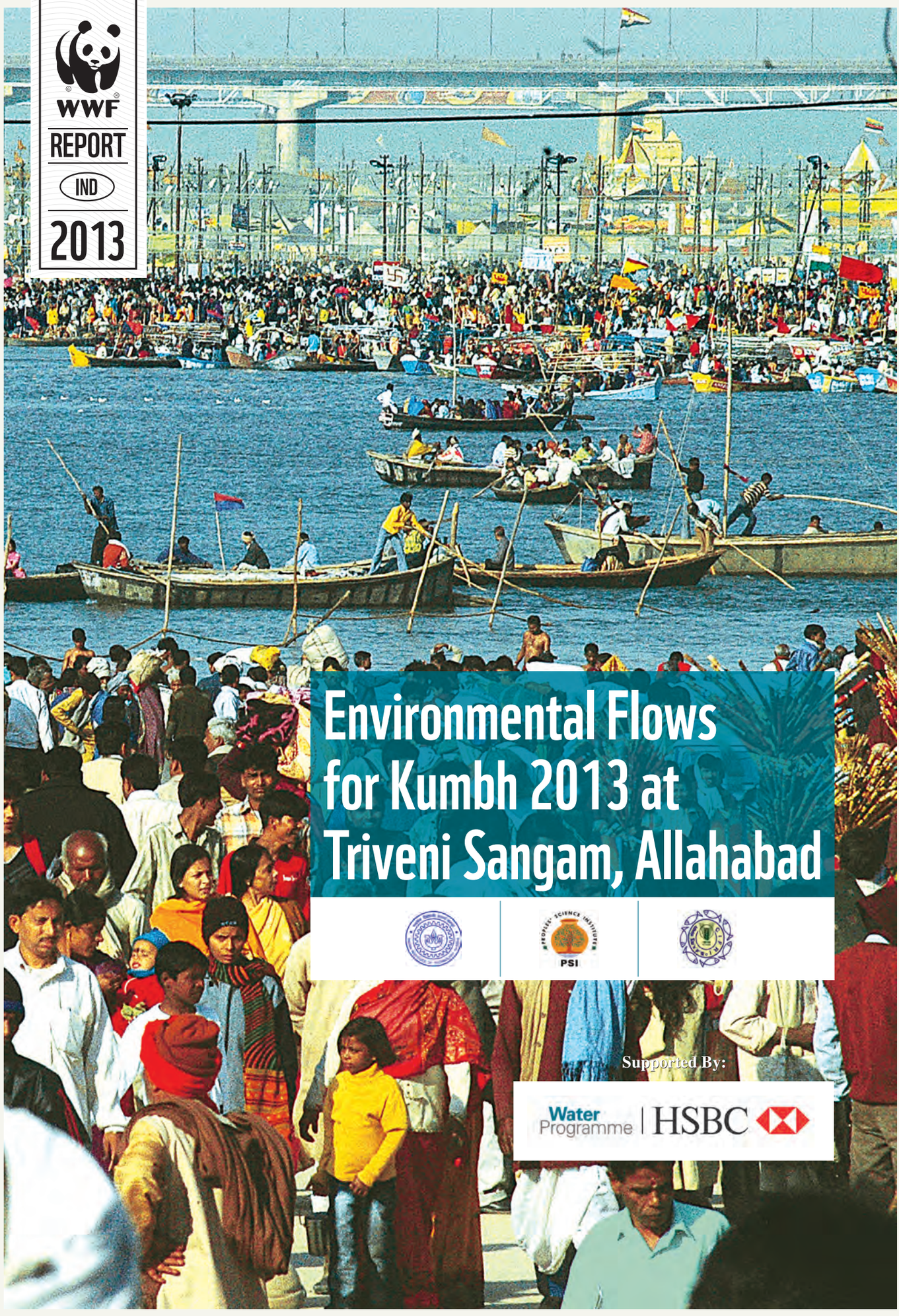

Environmental Flows for Kumbh 2013 at Triveni Sangam, Allahabad

PSI

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Environmental Flows for Kumbh 2013 at Triveni Sangam, Allahabad

RESOURCE PERSONS

Photo Credit: WWF-India

The E-Flows assessment for Kumbh 2013 was done by a multidisciplinary team from various organizations as given below:

Component of Study	Name	Affiliation
Facilitation and overall Coordination	Dr. Vinod Tare Mr. Nitin Kaushal Mr. Suresh Babu	IIT Kanpur WWF-India WWF-India
Socio-Cultural Surveys	Dr. Ravi Chopra Dr. Anil Gautam	PSI, Dehradun PSI, Dehradun
Hydraulic Modeling	Dr. Shivam Tripathi Dr. Rajesh Srivastava Dr. Ashu Jain Dr. Vinod Tare	IIT Kanpur IIT Kanpur IIT Kanpur IIT Kanpur
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Fluvial Geomorphology	Dr. Rajiv Sinha	IIT Kanpur
Cross Section Survey	Dr. Anurag Ohri	IT (BHU) Varanasi

The Working Group members, namely Swami Gyanswaroop Sanand, Prof. IC Agarwal, Mr. Paritosh Tyagi and Mr. Ravindar Kumar also contributed to this exercise.

Environmental Flows for Kumbh 2013 at Triveni Sangam, Allahabad

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Photo credit: Amritpal Singh

A *Sadhu* (holyman) worshipping the Ganga at Allahabad. The National River Ganga is considered sacred and revered by millions of Indians.

Chapter 1
PROLOGUE

Kumbh 2013 is expected to be the largest congregation of people for a religious purpose, anywhere in the world. Over 80 million people are expected to visit the city of Allahabad, Uttar Pradesh on the banks of the River Ganga from January 14 to March 10, 2013. It is believed that a holy dip in the Ganga during this period will help pilgrims attain salvation.

Kumbh has always been a socio-cultural mega event where millions of cultural tourists and pilgrims visit Sangam and take a holy dip for satisfaction of their spiritual aspirations. The flows in the river Ganga and the quality of its water has always been a talking point, not only amongst visitors and residents, but also within Government circles, as to how these issues can be resolved to make sure that the event is a success. The Hon'ble High Court of Allahabad has directed the Government of Uttar Pradesh that 50% of the basic discharge be released. There is also a demand for 'adequate' flows to ensure a free flowing and clean Ganga during Kumbh.

Kumbh is a unique opportunity for the Government of Uttar Pradesh to place itself as a pioneer on the world map for its efforts in restoring Environmental Flows for the welfare of people and nature. Environmental Flows (or simply E-Flows) are defined as the flows required for the maintenance of the ecological integrity of rivers, their associated ecosystems, and the goods and services provided by them. E-Flows are a pattern of flows required by the river to sustain its functions (socio-cultural, geomorphic or sediment transport, supporting biodiversity and livelihoods) and to fulfill the aspirations of the people.

The question is "How much flow in the river Ganga will meet the socio-cultural aspirations of the people during Kumbh 2013?" A scientific assessment of E-Flows is therefore warranted. This would greatly facilitate in making informed decisions so as to ensure E-Flows during Kumbh. In this context, it was decided that a rapid assessment of E-Flows for Kumbh 2013 at Allahabad would be a valuable contribution to the Government's efforts to ensure a clean Kumbh.

This is a unique opportunity for the Government of Uttar Pradesh to demonstrate its commitment to the people and nature by releasing not just 'adequate' flows but E-Flows. U.P. will become the first state in India to have taken steps to restore E-Flows in stressed rivers. This will also set an example for other states to initiate the process of E-Flows in their respective rivers.

Photo credit: Nitin Kaushal / WWF-India

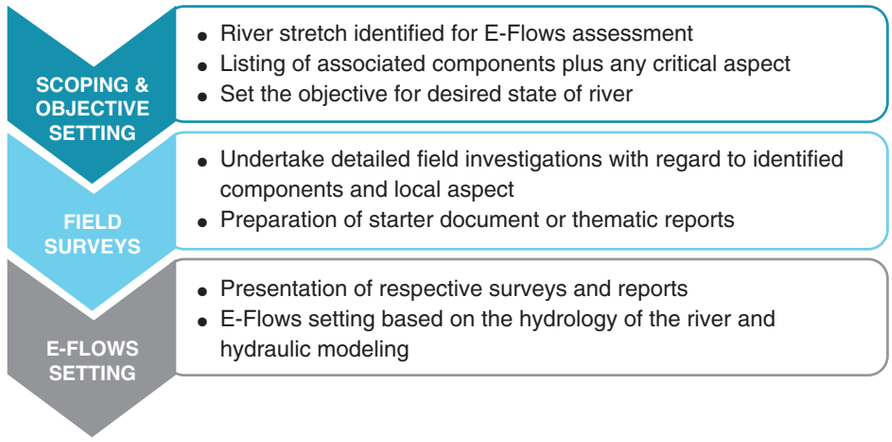
Current flows in the Ganga at Shastri Bridge, Allahabad during late December 2012. Lean flows in the Ganga are a matter of concern for the pilgrims and the Government.

Chapter 2
THE PROCESS

WWF-India initiated the assessment of E-Flows requirement during Kumbh 2013 using Building Block Methodology (BBM) – recognized internationally as a holistic and robust methodology. BBM, which has been used for rivers in different parts of the world, is also known for its flexibility, applicability and reliability under different levels of data and information availability. This methodology was further adapted to Indian conditions by WWF-India and its partners to carry out the assessment of E-Flows in the Upper Ganga basin[1]. The underlying principle that drove this work was that the studies related to E-Flows are multidisciplinary, and their assessment is both a social and technical process, with social choices at its core. Social choices reflect 'what society wants a river to do for them – to support culture and spirituality or livelihoods or biodiversity or all of the above functions and more'.

The BBM is being used for the assessment of E-Flows for the entire stretch of river Ganga[2] by the Consortia of seven IITs working on the 'Ganga River Basin Environment Management Plan' (GRBEMP). A flow chart illustrating the broad steps of BBM for the assessment of E-Flows is depicted below.

Figure 1: BBM process chart



In order to assess the flow requirement at Allahabad during Kumbh 2013 that meets the aspirations of the people and nature, a multi-disciplinary Working Group was convened by WWF-India, comprising technical institutions, NGOs and independent experts. The Working Group comprised the following expert members:

- Prof. Vinod Tare – IIT Kanpur
- Swami Gyanswroop Sanand – Vidya Math, Varanasi
- Prof. I. C Agarwal – Former Director, MNNIT, Allahabad
- Mr. Paritosh Tyagi – Former Chairman, CPCB, Delhi
- Dr. Ravi Chopra – PSI, Dehradun
- Dr. Anil Gautam – PSI, Dehradun
- Dr. K. D Joshi – CIFRI, Allahabad
- Mr. Ravindra Kumar – SWaRA, U.P.
- Mr. Nitin Kaushal – WWF-India
- Mr. Suresh Babu – WWF-India
- Dr. Sandeep Behera – WWF-India

1 O Keeffe Jay, Kaushal Nitin, Bharati Luna, Smakhtin Vladimir (2012) Assessment of Environmental Flows for Upper Ganga. Published by WWF – India

2 Environmental Flows: State-of-the-Art with special reference to Rivers in the Ganga River Basin, Report by Consortia of 7 IITs for Preparation of Ganga River Basin Environment Management Plan (GRBEMP), Report Code: 022_GBP_IIT_EFL_SOA_01_Ver 1_Dec 2011.

The purpose of setting up this Working Group was to initiate a consultative process to guide the process of assessment of E-Flows. The group met at CIFRI[3], Allahabad on November 16, 2012 and identified socio-cultural aspirations as the prime motivation for E-Flows during Kumbh. However, it was also suggested that flows required for ecological and geomorphological purposes should also be considered. Primary socio-cultural surveys were conducted from November 27, 2012 to December 5, 2012 at Allahabad, Haridwar, Rishikesh and Varanasi. Reports from the Consortia of seven IITs preparing the Ganga River Basin Environment Management Plan were used for information about fluvial geomorphological settings in the stretch of the river Ganga considered in this study. Existing research and data on aquatic biodiversity in the Ganga (around Allahabad), which is available with consortia of seven IITs, CIFRI and WWF-India was used. Since hydraulics and hydrology data was not available in the public domain, river cross section surveys at seven select places along with gauge and discharge measurements were also carried out to develop a hydraulic model and undertake reality checks.

Plate 1: Snapshot of area around Sangam at Allahabad indicating location of Cross Section surveys

Source: *IIT-Kanpur*

All surveys and studies were documented in the form of thematic reports and the same were presented and discussed at the E-Flows Setting Workshop organized on December 16 - 17, 2012 at IIT Kanpur. The objective was to arrive at the E-Flows values for Kumbh 2013 in Allahabad. Thematic groups filled up flow motivation forms indicating the desired water depth, water surface width, and velocity for two scenarios:

1. During entire Kumbh period, i.e. from January 14 to March 10, 2013.
2. Special *Snans* (bathing) scheduled on January 14, January 27, February 10, February 15, February 25 and March 10, 2013.

3 CIFRI-Central Inland Fisheries Research Institute

Chapter 3
RESULTS

3.1. DEPTH, WIDTH AND VELOCITY

The thematic groups recommended that the water depth considerations be treated as non-negotiable. Tables 1 and 2 summarize the recommendations made for the entire duration of Kumbh and for "special *snan* days" respectively at the site just upstream of Sangam represented by Cross Section 4 shown on Plate 1. The site falls in the bathing area identified by the Mela administration.

Table 1: Flow Motivation parameters for entire duration of Kumbh

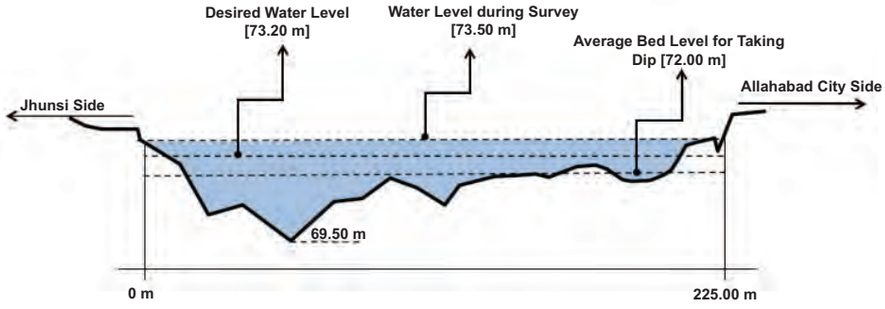
	Socio-Cultural	Bio-diversity	Fluvial Geomorphology	Recommendations
Average depth	1.2-1.5 m	1.5 m; mid channel depth 4.0 m for a width of 5.0 m	1.2 m	1.2 m [which corresponds to stage of 73.20 m at Cross Section 4]
Average velocity	0.4-0.6 m/s	0.5 m/s	1 m/s	0.4-0.5 m/s
Width	Adequate width for bathing [25 m]	5 m	–	–

Note: *1. Biodiversity Group's recommendations were driven by the requirements of keystone species—Indian major carps and Gangetic river dolphins; 2. Fluvial Geomorphology Group's recommendations were driven by the necessity to ensure longitudinal connectivity.*

Table 2: Flow Motivation parameters for "Special *Snan* Days"

	Socio-Cultural	Bio-diversity	Fluvial Geomorphology	Recommendations
Average depth	1.2-1.5 m	1.5 m; mid channel depth 4.0 m for a width of 5.0 m	1.2 m	1.5 m [this corresponds to stage of 73.50 at Cross Section 4]
Average velocity	0.4-0.6 m/s	0.5 m/s	1 m/s	0.4-0.6 m/s
Width	Adequate width for bathing [50 m]	5 m	–	

Figure 2: Schematic representation of Cross Section 4 depicting desired conditions during entire Kumbh duration



3.2. HYDRAULIC MODEL

The stage discharge curves were developed using Manning's equation assuming uniform flow condition. The Manning's roughness was obtained based on the values reported in the literature for similar conditions. The values were tested to be higher than its lower limit estimated from sieve analysis of bed material. The water surface slope was obtained by calibrating the Manning's equation against field data.

Using average water surface slope and measured water velocities for the river cross Cross Sections 1 and 4, a stage-discharge curve corresponding to Cross Section 2 was developed (Figure 3). This was used to assess the E-Flows corresponding to the flow motivation parameters recommended at Section 4. Since the distance between Cross

Sections 2 and 4 are approximately 1115 m, the gauge difference between these sections would be 0.33±0.11 corresponding to water surface slope 0.0003±0.0001. A stage versus water surface width correlation, as shown in Figure 4, was also developed corresponding to Cross Section 2. This relationship was used to assess the expected water surface width corresponding to the recommended stage.

3.3. ASSESSMENT OF ENVIRONMENTAL FLOWS

a) Entire Duration of Kumbh: Using the recommended water depth of 1.2 m, a stage of 73.53±0.11 m was determined for the entire duration of the Kumbh at Cross Section 2. Corresponding to this stage the estimated flow is 225 cumecs (7,950 cusecs). The estimated water surface width for this stage is 175 m.

b) Special *Snan* Days: Using the recommended water depth of 1.5 m, a stage of 73.83±0.11 m was determined for Special snan days at Cross Section 2. Corresponding to this stage the estimated flow is 310 cumecs (10,950 cusecs). The estimated water surface width for this stage is 325 m.

For calculating the E-Flows requirements it is assumed that all the untreated and partially treated wastewater discharges are stopped from entering the Ganga.

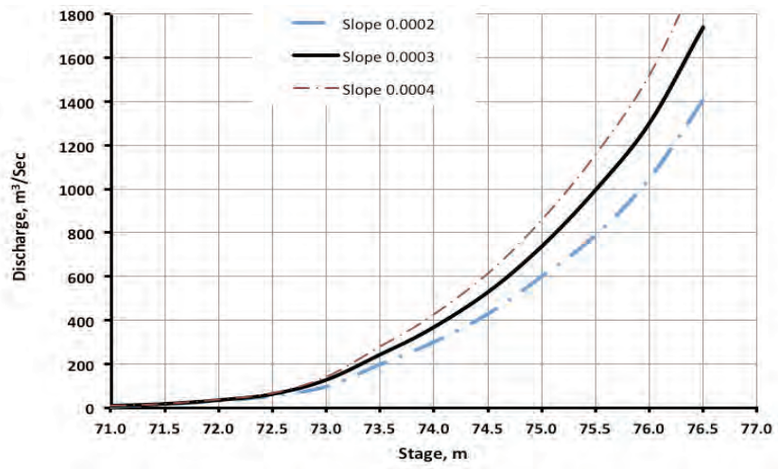


Figure 3: Stage-Discharge Curve developed for Cross Section 2

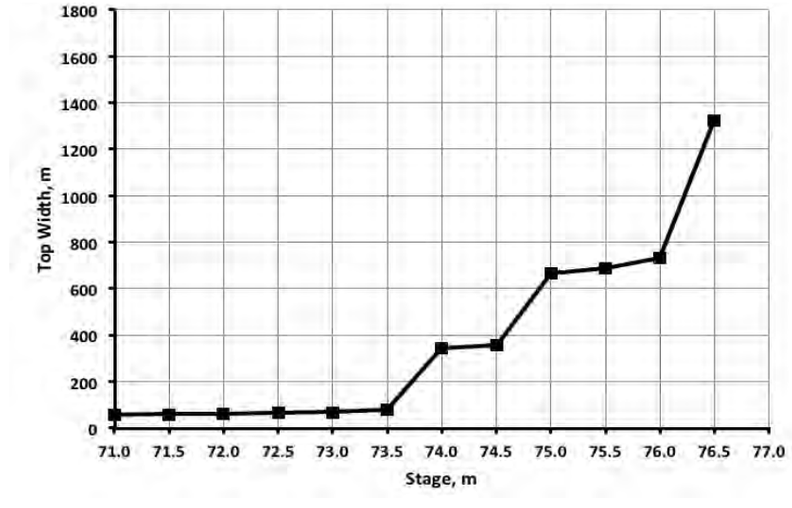


Figure 4: Stage versus estimated water surface relationship for Cross Section 2

Chapter 4
EPILOGUE

It is hoped that this document will serve as a reference for the Government of Uttar Pradesh and other stakeholders to ensure Environmental Flows during Kumbh 2013. Given the fact that decisions regarding water are often political in nature, Kumbh acts as both an opportunity and a challenge for the Government of Uttar Pradesh. It is one of the greatest opportunities to demonstrate the Government's sensitivity and commitment towards people and nature by releasing not just 'adequate' water but scientifically calculated Environmental Flows.

The Government of U.P. has already committed that 71 cumec (2,500 cusec) will be released from January 1 to February 28 and 43 cumec (1,500 cusec) during March 1 to 10, 2013[4]. By announcing the release of water during Kumbh 2013, the Government of Uttar Pradesh has already shown its commitment to the river and the people. By releasing E-Flows the state of U.P. will set an example for many states across the country that are grappling with the issue of water releases in rivers.

For this to happen, a water allocation plan will need to be developed that targets three key major water structures — the Tehri Dam, Bhimgoda Barrage and the Narora Barrage — and will probably need to reallocate water for the environment and people. If increased releases result in a reduction of water available for agriculture, then this needs to be communicated to the farmers well in advance.

It is proposed that a Joint Monitoring Group comprising the U.P. Government (Mela administration, U.P. Irrigation Department, U.P. Pollution Control Board), reputed institutions like IIT Kanpur, MNNIT Allahabad, Civil Society Groups, cultural leaders, independent experts and NGOs, be setup. It is proposed that the stage at Shastri bridge be monitored by this group at 8:00 AM, 12:00 PM and 16:00 PM on a daily basis. The recommended stages at the Shastri Bridge are 73.46±0.09 for the entire duration of Kumbh and 73.76±0.09 on Snan days. These values correspond to the stages recommended for Cross Section 2 in page no. 10 (Section 3.3 Assessment of Environmental Flows). Using the monitored stage, corresponding discharges can be worked out from the stage-discharge curve and presented in the public domain.

It is also important to monitor the river's health (a comprehensive way of looking at the ecosystem health of the river—people's perceptions, livelihood functions, ecology, water quality, catchment, flow, etc.) during and after Kumbh. This would enable the Government and the stakeholders to also assess the impact of maintaining Environmental Flows on river health. Probably a first and a bold step towards the conservation of Indian rivers!

4 This is based on published news reports.

Photo credit: Nitin Kaushal / WWF-India

The Ganga river supports a rich variety of flora and fauna all along its course. Releasing E-Flows will not only fulfill the cultural aspirations of millions of pilgrims but also help restore the biodiversity.

APPENDIX

1.1. FIELD SURVEY - CROSS SECTIONS (NOVEMBER 29, 2012 - DECEMBER 2, 2012)

Cross Section surveys were conducted at identified locations in the Ganga around the Sangam area. This exercise was done by a joint team from IIT Kanpur and IT (BHU) Varanasi. The survey levels were taken from marks made on right bank pillar of railway bridge. The locations of various sites where Cross Section surveys were done are presented in Table 3.

Table 3: Location of Cross Sections

CS No	Location	Left Side		Right Side	
		Latitude, N	Longitude, E	Latitude, N	Longitude, E
CS-1	U/S of both bridges (Shastri bridge & railway bridge)	25°26'42"	81°53'04"	25°26'29"	81°54'20"
CS-2	B/W bridges (Shastri bridge & railway bridge)	25°26'28"	81°52'59"	25°26'04"	81°54'05"
CS-3	D/S of both bridges (Shastri bridge & railway bridge)	25°26'11"	81°52'46"	25°25'43"	81°54'01"
CS-4	U/S of Sangam (Ganga)	25°25'58"	81°52'43"	25°25'25"	81°53'59"
CS-5	U/S of Sangam (Yamuna)	25°25'14"	81°52'45"	25°25'45"	81°52'53"
CS-6	Shivkuti	25°29'56"	81°52'31"	25°30'50"	81°53'00"
CS-7	D/S Sangam	25°24'49"	81°53'17"	25°25'17"	81°54'08"

Photo credit: Ankit Modi / IIT-Kanpur

Photo credit: Nitin Kaushal / WWF-India

Plate 2: Cross Section surveys underway at Allahabad

Discharges presented in Table 4 were calculated based on the Cross Section data and velocity measurements carried out by the survey team.

Table 4: Location, Discharge and Average Depth observed during survey

C/S	Location	Date	Time, h	Discharge, m^3/s	Average Depth, m
CS 1	U/S of both bridges (Shastri bridge & railway bridge)	November 30, 2012	14:00	395	1.57
CS2	B/W bridges (Shastri bridge & railway bridge)	December 1, 2012	08:00	260	1.61
CS 3	D/S of both bridges (Shastri bridge & railway bridge)	December 1, 2012	10:00	310	1.21
CS 4	U/S of Sangam (Ganga)	December 1, 2012	14:00	255	1.62
CS 6	Shivkuti	December 2, 2012	11:00	194	0.68

Note: *During the survey, a diurnal variation in stage and discharge was noticed. The discharges reported are based on a one-time measurement at the time of the survey. It is expected that the discharge is likely to reduce during the period from January to March 2013*

2. SOCIO-CULTURAL SURVEYS (NOVEMBER 26, 2012-DECEMBER 5, 2012)

People's Science Institute (PSI, Dehradun) conducted socio-cultural surveys to capture the aspirations of the people and cultural leaders. The socio-cultural surveys focused on Allahabad, though interviews with spiritual leaders were also conducted in other towns such as Rishikesh, Haridwar and Varanasi.

Table 5: Respondents of the Socio-Cultural survey

Type of respondents	Haridwar	Rishikesh	Allahabad	Varanasi	Total
Spiritual Leaders	13	8	2	3	**26**
Akhara Pramukh	5	-	14	4	**23**
Mela Prashasan	1	-	2	-	**3**
Pilgrims/panda	-	-	41	-	**41**
Residents (including shopkeepers & boatmen)	-	-	24	-	**24**
Total respondents	**19**	**8**	**83**	**7**	**117**

Source: *Starter Document-Socio-Cultural Surveys*

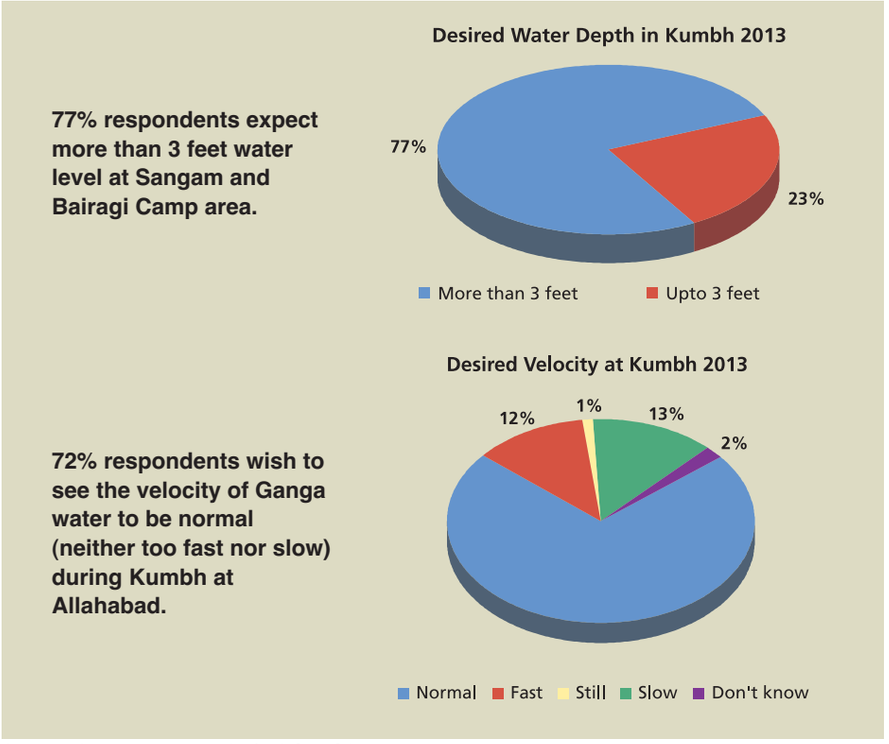
Plate 3: Socio-Cultural survey underway

Photo credit: PSI-Dehradun

Photo credit: PSI-Dehradun

The field surveys were conducted from November 26, 2012 - December 5, 2012. The questionnaires broadly covered three areas—social importance of river Ganga, effect of Ganga on people's lives, and thresholds of probable concern.

Figure 5: Analysis of Socio-Cultural Surveys



Source: *Starter Document-Socio-Cultural Surveys*

The overall findings of the survey are:

i. The depth of the water at both banks (upto 25 m) and in the Sangam area (upto 50 metres) should be 0.9-1.2 m (3-4 feet). However some spiritual leaders expressed the desire for depths between 1.2-1.5 m (4-5 feet).
ii. The velocity of water should be normal (neither too fast nor too slow).
iii. About 63% respondents opined that –
    a. The flow of water during special snan days (January 14, January 27, February 10, February 15, February 25 and March 10) should be two times more than the flow of water in the *Magh Mela* last year around January 14.
    b. The flow of water during the other days of Kumbh should be one and a half times more than the flow of water in the *Magh Mela* last year around January 14.
iv. The discharge of untreated waste into the river should not be allowed.

3. INFORMATION ON AQUATIC BIO-DIVERSITY OF THE STRETCH REPRESENTING RIVER GANGA AT SANGAM

From the perspective of biodiversity, a 475 km long Ganga stretch from Fatehgarh to Varanasi (Fatehgarh to Allahabad – 331 km and Allahabad to Varanasi – 144 km) was selected for detailed investigations. This relatively long stretch was selected due to the homogeneity within this expanse in terms of eco-climatic conditions and physical characteristics. Additionally, the aquatic biodiversity often has migratory characteristics and their diurnal migration can extend up to 40-50 km. Most of the research work within this component was based on secondary data, expert's opinion and existing knowledge-base.

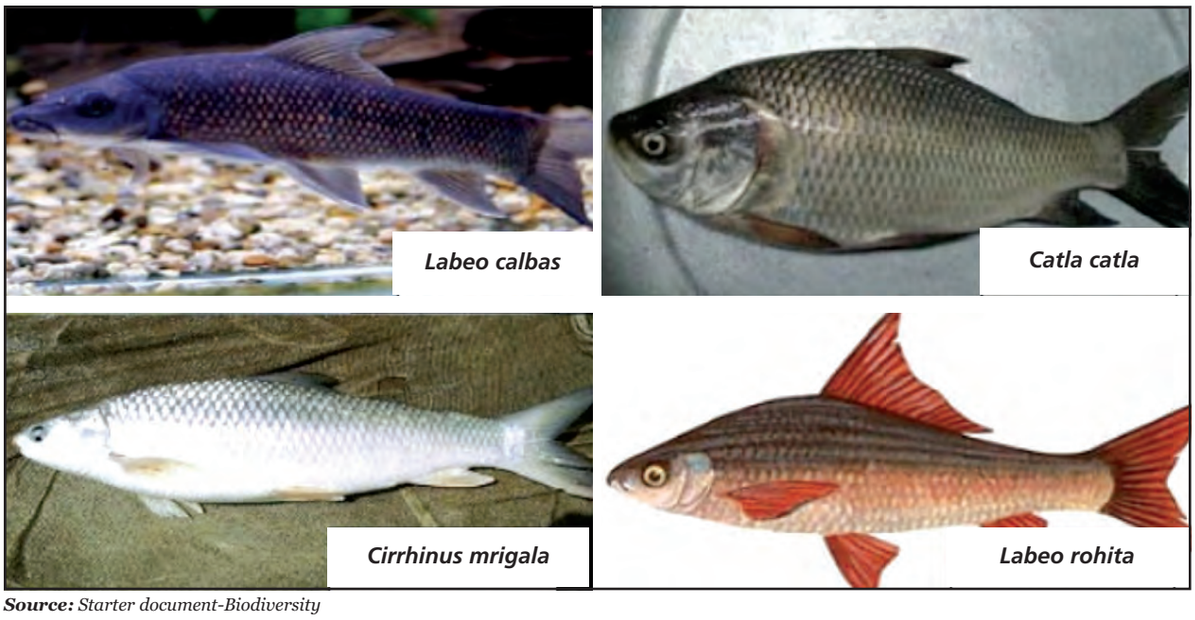
The Ganga in this stretch is biologically very productive due to high concentrations of nutrients, warm water, meandering of the river, flood plains and low velocities. The team concluded that for this section, the following species are the important ones and need to be conserved in order to ensure a healthy aquatic ecosystem, in general, and the food chain, in particular.

Table 6: Keystone species in the Fatehgarh-Varanasi stretch

1. *Labeo rohita* (Rohu)
2. *Catla catla* (Catla)
3. *Cirrhinus mrigala* (Mrigal)
4. *Labeo calbasu* (Calbasu)
5. *Platanista gangetica gangetica* (Gangetic river Dolphin)
6. *Aspideretes gangeticus* (Soft shelled Turtles)
7. *Kachuga sp.* (Hard shelled Turtles)
8. *Gavialis gangeticus* (Gharyal)

Note: *The four species belong to the Indian Major Carp (shown in Plate 4)*

Plate 4: Indian Major Carps considered for the study



Source: *Starter document-Biodiversity*

Ecological conditions for maintenance and survival of keystone species (Indian major carps and Gangetic river dolphins) has been worked out and can be summarized as follows.

Table 7: Requirements of Keystone species

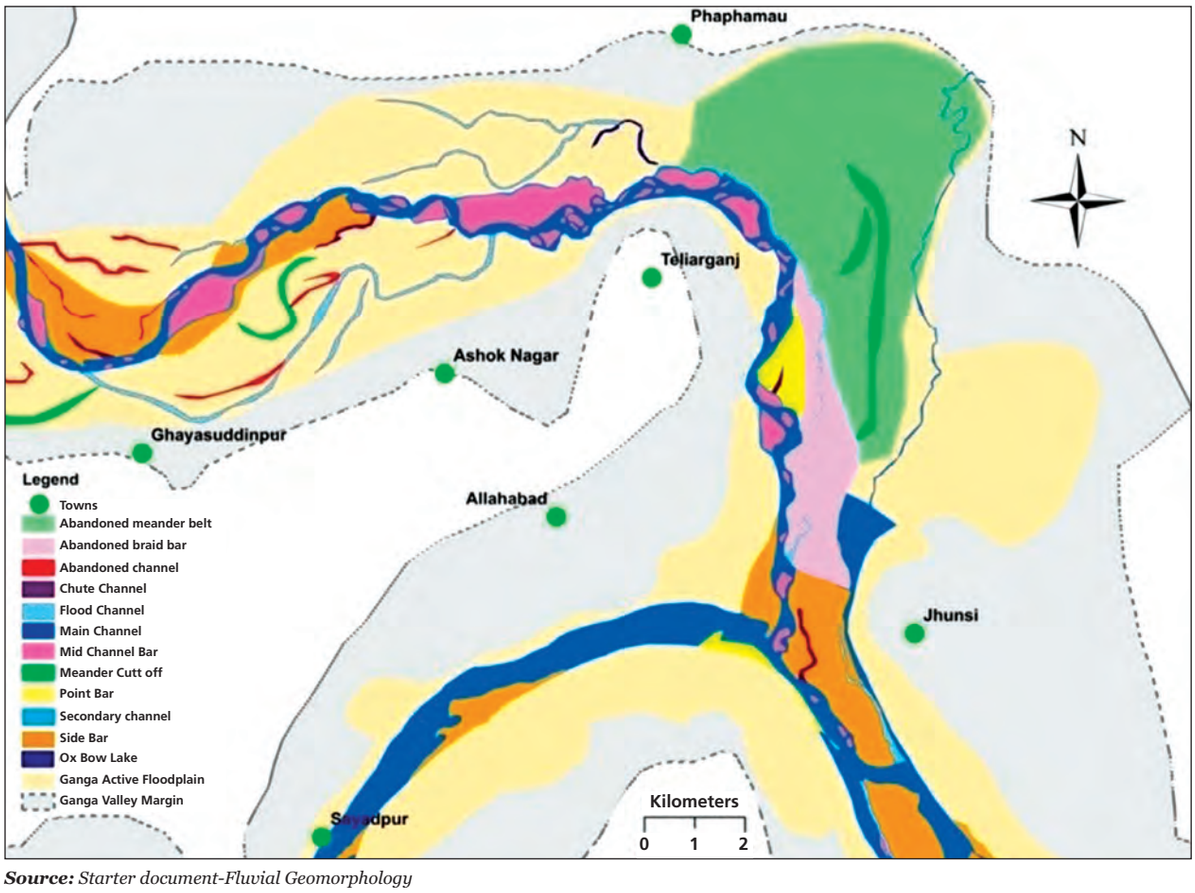
Shallow muddy banks with water	< 0.5 m
Average depth of water column depth	1.5 m
Mid river channel	4 m
Average velocity of water	0.3 - 0.5 m/s
Substrate/Sand bars	Silt over sand

The above requirement will also meet the water requirement for other biota.

4. INFORMATION ON FLUVIAL GEOMORPHOLOGY AROUND SANGAM

River morphology and its complexity is an important aspect of a riverine ecosystem and it is an integral part of the E-Flows assessment exercise. Figure 6 shows major geomorphic features present in the channel in this stretch and the most dominant units are seen to be lateral bars and mid-channel bars. The channel belt is approximately 2 km wide at the confluence and the valley margin is much wider. The channel is multi-thread and the channel multiplicity would generally increase during low flows.

Figure 6: Geomorphologic features of the River Ganga around Sangam



Source: *Starter document-Fluvial Geomorphology*

The key geomorphologic considerations along the stretch of the river Ganga around Sangam are –

- *Geomorphic connectivity* – Longitudinal and lateral (during the month of January to March 2013, which is a low flow season, the longitudinal connectivity will play the major role)

- *Geomorphic processes including sediment supply and dynamics* – Although these are long term processes, it is important that there is a minimum flow available for movement of sediments and nutrients so as to maintain the desired morphology of the river, even for a short time

- *Bank characteristics such as sediment type, riparian vegetation* – During the January - March flows, it is not expected that riparian vegetation will be inundated, so, this criteria takes a low preference for determining the required flows.

It was recommended that the major geomorphic consideration for arriving at optimum January - March flows would be the maintenance of longitudinal connectivity of the river. The geomorphology team was present during the Cross Section surveys at the identified locations in and around Sangam. Based on the field visit, secondary data and expert opinion, the team recommended a minimum water level (depth) of 1.5 m, at which longitudinal connectivity would not be lost.

5. E-FLOWS SETTING WORKSHOP

On December 16 - 17, 2012, an E-Flows setting workshop was organized at IIT Kanpur, where all the Working Group members and thematic teams participated to work out the required E-Flows for Kumbh 2013 at Allahabad. The workshop began with an overview presentation, followed by a presentation of thematic reports and discussions on the recommendations.

Plate 5: E-Flows Setting Workshop

Photo credit: IIT-Kanpur

Plate 6: Flow Motivation Exercise

As part of the E-Flows setting process, Flow Motivation Forms were filled by the thematic teams along with the Working Group members. The recommended flows by various thematic groups were discussed and debated to arrive at final values, which were agreeable to all members.

Photo credit: Nitin Kaushal / WWF-India

Photo credit: Nitin Kaushal / WWF-India

Plate 7 gives an overview of location on Ganga at where Cross Section 4 was taken. This place is at immediate upstream of Sangam.

Source: *IIT-Kanpur*

Plate 7: Snapshot of area around Section 4, upstream of Sangam, considered for E-Flows assessment

Photo credit: Nitin Kaushal / WWF-India

Sunset at Allahabad

WWF-India's **Rivers for Life, Life for Rivers** programme envisions the Ganga as a healthy river system that is rich in biodiversity, providing long term water security to communities and nature. This initiative is supported by the HSBC Water Programme (HWP), a five year partnership between HSBC, WWF, WaterAid and Earthwatch. During 2012 - 2017, HWP aims to deliver a powerful combination of water provision, protection and education resulting in the most ground-breaking water programme committed to by a financial organization.

WWF-India will be building on its Living Ganga Programme (LGP (2007 - 2012)), which has developed, validated and implemented some of the most innovative pathways and processes for sustainable water resources and energy management in the face of climate change. These include pioneering work such as methodologies for assessment of Environmental Flows, water and energy footprint work with industries, pollution abatement in cities using bioremediation, engagement in the development of a dolphin action plan, reintroduction of gharials as well as climate vulnerability assessment and ecosystem based climate adaptation. The LGP's focus area was the critical 800 kilometer stretch of the Ganga from Gangotri to Kanpur spanning the Upper Ganga Basin.

The new phase of the programme, **Rivers for Life, Life for Rivers** seeks to implement the lessons learned from the LGP and apply this basin management framework to the Ramganga River– the first major tributary of the Ganga. The Ramganga River replicates the Ganga in terms of major issues faced, thereby presenting some complex and nested challenges in water resource management. It attempts to maximize the impact of ongoing work in the Ganga and its mainstreaming by various actors, WWF-India plans to continue some of the key initiatives of the LGP. The focus lies in the 300 kilometer stretch of the Ramganga and the 900 kilometer stretch of the Ganga (from Bijnore to Varanasi).

The four pillars of the programme are:

- **Sustainable Water Management:** Working towards ensuring Environmental Flows and sustainable water management.
- **Habitat and Biodiversity Conservation:** Improving the population and habitats of 7 endemic and endangered aquatic species (Gangetic Dolphins, gharial, Otters, Mahseer (fish) and 3 species of turtles, across 400 km (6 districts) of the Ganga and the Ramganga River.)
- **Water stewardship:** Collaborating with cities and SMEs in the Ganga basin to manage water related risks by adopting water stewardship (protection of sources, cleaner production, sustainable consumption, green financing along with concerted stakeholder action and policy dialogues). Multi stakeholder groups will be formed to actively engage in river conservation.
- **Climate change adaptation:** Developing a framework for climate adaptation so as to reduce climate vulnerabilities and improve base-flows in the Ganga and its tributaries.

The approach of the programme will incline towards policy advocacy and engagement of riparian communities with the aim of creating sectoral and basin level as well as state and national level outreach to generate support and catalyse action towards conserving the revered river Ganga.

Supported By:

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Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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