

F.No.25/3/2010-ESZ
Government of India
Ministry of Environment, Forest & Climate Change
(ESZ Division)

Indira Paryavaran Bhawan,
Aliganj, Jorbagh Road
New Delhi – 110 003

Dated:16th July, 2020

OFFICE MEMORANDUM

Subject: Zonal Master Plan (ZMP) of Bhagirathi Eco- sensitive Zone, Uttarkhand- regarding.

The Ministry of Environment, Forest and Climate Change issued Bhagirathi Eco-Sensitive Zone Notification *vide* S.O. No.2930(E) dated 18th December, 2012 under the Environment (Protection) Act, 1986.

2. As per para 2 of the Notification, Ministry of Environment, Forest and Climate Change is mandated to approve the Zonal Master Plan (ZMP) for sustainable development of the Ecologically Sensitive Area of Bhagirathi.

3. The Zonal Master Plan submitted by Government of Uttarakhand *vide* letter No. 800/X-3-18-15(41)/2013 dated the 27th September, 2018 has been examined by Ministry of Environment, Forest and Climate Change and Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti.

4. Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR) in the Ministry of Jal Shakti, *vide* letter No. L-34014/1/2018 dated the 6th March 2020 have conveyed their concurrence on the water related issues in Bhagirathi catchment area. A copy of communication dated 6th March 2020 conveying concurrence from DoWR, RD & GR is enclosed for reference. The State Government is required to fulfil and comply with the suggestions and remarks, as stipulated by the Do WR, RD&GR, Ministry of Jal Shakti including maintaining the e-flow of the Bhagirathi River, long term conservation plan for natural springs and boundaries of Bhagirathi river bank keeping in view of disaster management situations.

575398/2021/ESZ

5. Ministry of Environment, Forest and Climate Change advises the State Government to inter-alia ensure effective implementation of the provisions of the ESZ Notification dated 18th December, 2012, as amended time to time including boarder area development plan (Para 2 sub para 3 of the Notification). A comprehensive long term Eco-Tourism Master Plan and the carrying capacity of catchment area, etc. may be finalized on priority.

6. Ministry of Environment, Forest and Climate Change hereby accords its approval to the Zonal Master Plan of Bhagirathi Eco-Sensitive Zone Notification subject to observations given at Para 4 & 5 above.

This issues with the approval of Competent Authority.

Encl: concurrence report of DoWR, RD&GR, MoJ dated 06.03.2020



(Lalit Bakolia)
Scientist 'F'

To

The Chief Secretary
Government of Uttarakhand,
4 Subhash Road, Uttarakhand Secretariat,
Dehradun - 248001

Office of AS (RA)
Dy. No. 265095
Date 18/03/20

No.L- 34014/1/2018-PP 59+60

भारत सरकार

Government of India

जल शक्ति मंत्रालय

Ministry of Jal Shakti

(Department of Water Resources, River Development & Ganga Rejuvenation)

Shram Shakti Bhawan, Rafi Marg
New Delhi, dated 6th March, 2020Office Memorandum

Secy-on leave
AS (RA) sub:- Zonal Master Plan for Bhagirathi Eco Sensitive Zone (BESZ).

AD (SCG) 18/3
Pl. put up immediately. 18/3/2020
Dy. (LB) 18/3/2020

The undersigned is directed to refer to MoEF&CC O.M. dated 16.04.2019 vide which this Department was requested to convey its considered opinion for approval or otherwise regarding the Zonal Master Plan of Bhagirathi Eco Sensitive Zone. In this regard, it is to mention that the Hon'ble Supreme Court vide order dated 13th July 2018 had directed MoWR, RD&GR to get the draft Zonal Master Plan scrutinized from the following 11 persons who were suggested by the Ministry itself in its letter dated 7th August 2017.

- i. Dr. Ravi Chopra, Director, People's Science Institute, Dehradun
- ii. Dr. Navin Juyal, Geologist, National Physical Laboratory, New Delhi
- iii. Dr. S. Sathya Kumar, Wildlife Expert, WII, Dehradun
- iv. Dr. Vinod Tare, Professor, IIT Kanpur
- v. Prof. A. K. Gosain, IIT Delhi
- vi. Prof. Brij Gopal, Biodiversity Expert, Delhi University
- vii. Dr. D.P. Dobhal, Glaciologist, Wadia Institute of Himalayan Geology, Dehradun
- viii. Shri Chand Prasad Bhatt, Environmentalist, Uttarakhand
- ix. Dr. Hemant Dhayani, Local Resident, Eco-Sensitive Zone, Uttarakhand
- x. Shri Jagat Singh Jangli, Local Resident of Uttarakhand
- xi. Dr. Sharad Kumar Jain, Director, NIH, Roorkee

2. Accordingly, in compliance to the Hon'ble Supreme Court order dated 13th July 2018, the revised Zonal Master Plan received from the Government of Uttarakhand was circulated by this Ministry to the aforementioned 11 persons for examination and their comments.

Subsequently, the comments received from all the 11 experts were forwarded to the Government of Uttarakhand for their compliance/views.

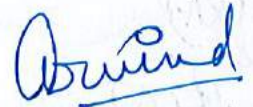
Office of Secretary (EF&CC)
e-office No. 265095
Date 18/3/2020

AD (SRB)

265095/Dir (UB)
18/3/2020
AS (E2)

17/3/20

4. In response, Government of Uttarakhand has submitted their views on the comments (copy enclosed) of 11 experts.
5. MoEF&CC has constituted a multi-ministerial Expert Committee with a mandate to examine various Zonal Master Plan of Eco-Sensitive Zone. As such, this department has examined the Zonal Master Plan with respect to water related issues only and all other issues/ chapters may be got examined by the MoEF&CC through multi-ministerial Expert Committee.
6. This Department conveys its concurrence with respect to the water related issues of Zonal Master Plan of Bhagirathi Eco Sensitive Zone subject to compliance of the comments of the 11 Experts and remarks of D/o WR,RD&GR (copy enclosed)



(A.J. Soreng)

Under Secretary to the Government of India

T.No.2371 4350

Email: uspp-mowr@nic.in

To,

✓ The Secretary,
Ministry of Environment, Forest and Climate Change,
Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi-110003.

Copy to:

- 1) Scientist 'F', ESZ – Division, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003., [Kind Attention: Dr. Subrata Bose, Scientist 'F']

Compliance of General Comments

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1.	Dr. Ravi Chopra, Director, People's Science Institute	<ul style="list-style-type: none"> The fresh draft of the Zonal Master Plan forwarded by MoWR is an improvement on the earlier drafts prepared by the Government of Uttarakhand in terms of its presentation. The text is better edited. Many spelling errors have been corrected. One significant change is the dropping of nine SHPs in the Bhagirathi Eco-Sensitive Zone, a point that had been repeatedly emphasized by the Expert Members of the NGT. Concerns for drying springs, environmental flows in river Bhagirathi and glaciers' melting expressed in the General Overview are not addressed in a targeted manner in the ZMP. 	<p>In light of the spirit of the BESZ notification S.O. 2930 (E) dated 18/12/2012 and in accordance with the views expressed by some of the members of NGT committee, Energy department is taking up only those projects which are up to 2 MW.</p> <p>Concerns for drying springs, environmental flows in river Bhagirathi and glaciers' melting have been addressed in chapter 2. However, the strategies of targeted manner shall be incorporated at the micro plan level.</p>	<p>Complied.</p> <p>GoU has mentioned that the strategies in targeted manner shall be incorporated at the micro plan level.</p>
2.	Dr. Vinod Tare, Professor, IIT Kanpur	<p>a) Carrying capacity study for 10 HEPs BY IIT Roorkee should be reviewed by multi-stakeholder group including WII, FRI and C ganga.</p> <p>b) Instead of modifying the ESZ notification [replacing definition of 20° for "Steep Hill Slopes" as mentioned in BESZ Notification by the definition of</p>	<p>As hydro-projects more than 2 MW capacities are not taken up in Master plan of BESZ. Hence no need for further carrying capacity studies as of now.</p> <p>As per amended vide gazette notification no of MoEF & CC: - S.O 1656 (E) dated 16-04-2018 "steep hill slope" shall have the same meaning as assigned to in categorization in IS</p>	<p>Complied. Projects >2 MW have already been excluded from the revised ZMP.</p> <p>As per the modified BESZ notification dated 16.04.2018, "steep hill slope" shall have the same meaning as assigned to in categorization in IS code 14496 (part 2):1998 : Indian Standard for Preparation of</p>

84

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		<p>"Steep Hill Slopes" in BIS IS Code No. 14496 (Part-2) 1998], permission should be sought case by case basis as a special case.</p>	<p>Code 14496 (Part 2) 1998 Indian Standard for Preparation of Landslide Hazard Zonation Maps in Mountainous Terrains- Guidelines.</p> <p>As per Bureau of Indian Standards Code No. 14496 (Part 2) 1998</p> <ul style="list-style-type: none"> - Slope upto 25 degrees is termed as gentle slope. - Slope from 26 degree to 35 degree is termed as moderately steep slope. - Slope from 36 degrees to 45 degrees is termed as steep slope. - Slope exceeding 45 degree is termed as cliff. <p>These provisions are according to suggestions given by Hon'ble member. Therefore, seeking for permission case by case basis is not justified.</p>	<p>Landslide Hazard Zonation Maps in Mountainous Terrains-Guidelines"</p> <p>The definition of "Steep Hill Slopes" as per IS Code No. 14496 (Part-2) 1998 may be adhered to.</p>
		<p>c) In respect of allowing the River Bed Mining (RBM) up to a depth of 2 m for meeting the local needs, it is suggested that it should be done based on what is available without impacting the river and not based on demand.</p>	<p>If the River Bed Material (RBM) is transported from the outer area to cater the genuine demand of locals, the carbon footprint and the environmental impact would be on the higher side. It's to be added further that environmental concerns are duly being addressed while permitting every individual case of the RBM extraction.</p> <p>The Extraction of River Bed Material (RBM) up to a 2 m depth cannot be</p>	<p>GoU may ensure compliance of the points mentioned in its response.</p>

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			<p>done unless the compliance of the following points is covered.</p> <ul style="list-style-type: none"> • Joint Inspection with Forest and other Departments. • Geological survey by Mining Department. • Environment Impact Assessment. • Clearance from Pollution Control Board. • Necessary to improve carrying capacity of river or stream, so that maximum flood discharge can pass safely i.e.; without inundation and optimum bank erosion. • Important Terms and condition are there for regulated mining, like: - Appointment of Task force for Inspection of Extraction of River Bed Mining etc. <p>Hence from above it implies that it would neither impact the river nor based on demand.</p>	
		<p>d) Should clarify whether the Monitoring Committee which had been constituted under the Chairmanship of Chief Secretary vide Office Memorandum No. 25/3.2010-RE dated October 10, 2013 of Gol is an ongoing committee or its</p>	<p>The Office memorandum of MoEF & CC 25/3.2010-RE dated 05/04/2018, clearly states in its terms of reference no. viii, that the tenure of the monitoring committee is for three year or till its reconstitution and same has been annexed as Annexure 3 on page no. 47 in part 3 of ZMP.</p>	<p>Replied by GoU.</p>

86

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		<p>term is over?</p> <ul style="list-style-type: none"> Site specific hydrological studies are very important before undertaking any interventions. 	<p>As per the demand of the individual case, site specific hydrological studies would be conducted if necessary. Guidelines for Aquifer Conservation and Management" are also incorporated in ZMP on page no. <u>56-57 of chapter 2 in part 1.</u></p>	<p>Replied by GoU.</p>
		<ul style="list-style-type: none"> It is important to consider that the developmental projects like Hydro-power projects, road cutting, etc., may have irreversible impact on the perennial aquifer sources in the region. 	<p>Before taking up any developmental project, due consideration is being paid to avoid or minimize any adverse impact to the perennial aquifer sources. For example, in road cutting projects the alignment shall be selected considering the following points:</p> <p>(a) As far as possible, alignment having minimum aquifers encounter is being selected.</p> <p>(b) Detailed geological study of the alignment is being carried out to identify active aquifers.</p> <p>(c) In unavoidable circumstances, it should be dealt by either changing the alignment or providing exceptional gradient as per the norms.</p> <p>(d) Catch water & intercepting drains are being provided on hill slopes.</p> <p>(e) Road side drains and cross drainage shall be provided as per geology of the site.</p>	<p>Replied by GoU.</p>

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			<p>(f) For cross drainage scuppers, culverts, minor or major bridges and causeways shall be provided as per requirement of the site.</p> <p>Such type of provisions has been incorporated in Page 206 of ZMP.</p>	
3	Prof. Brij Gopal	<ul style="list-style-type: none"> The Draft BESZ management plan is in no way a plan envisaged under the BESZ notification which was issued specifically "for the maintenance of environmental flow and ecology of the river Bhagirathi from Gaumukh to Uttarkashi" and in recognition of the fact that "construction of hydropower projects may adversely affect this unique ecosystem" and that "irreparable damage to the fragile mountain ecosystems including flow and character of the river" was caused by the "tremendous increase in the anthropogenic pressure on ecosystem and environment" due to "continuous and phenomenal increase in the human and cattle population". 	<p>In light of the spirit of the BESZ notification dated 18.12.2012 and in accordance with the views expressed by some of the members of NGT committee, Energy department is taking up only those projects which are up to 2 MW.</p> <p>The 98 percent area of BESZ is under direct control of forest department and being regulated under various stringent provisions. The key anthropogenic pressure and human intervention in core forest areas in the National Park and reserve forest key is regulated by forest department. Entry in Gaumukh is regulated by allowing only 150 persons per day as per the Chief Secretary, Uttarakhand order DAMC, dated 21/04/2008. According to the provision made in Management Plan of GNP, mass gathering in Nelang valley of Gangotri National Park is regulated by allowing entry of only 6 vehicles with 6 people in each. It also to be submitted that human activity in the Gangotri Dham & other tourist areas are also being</p>	Replied by GoU.

88

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		<p>The Draft ZMP is at best an Economic Development Plan for the region that compiles the sectoral plans of different departments following most of the plans, policies, programs and schemes of the Central and the State Government. It does not address the concerns for conservation of the ecology and environment of the river Bhagirathi and the restoration of anthropogenic degradation in the ESZ. The ZMP grossly violates both in letter and spirit the mandate of the ESZ notification.</p> <ul style="list-style-type: none"> The ESZ notification mandated that: 2(4) The Zonal Master plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention. 	<p>regularized by concerning department.</p> <p>The draft ZMP contains the activities like the soil & moisture conservation measures for streams / tals discussed in chapter 2 and the flood plain zoning laid down in chapter 6, plantation schemes in chapter 1 and many more schemes/ activities discussed in ZMP which are directly related to conservation of ecology and environment of Bhagirathi river and restoration of anthropogenic degradation in the ESZ.</p> <p>Due weightage has been given to the compliance of BESZ Notifications and all necessary consideration of hon'ble committee members has been taken into account during the meetings Dated 20/11/2017, 09/12/2017, 09/01/2018, and 02/05/2018.</p> <p>Clause 2(4) Denuded area has been identified in the Working plan of Uttarkashi Forest Division and for the restoration of the same plantation scheme with its guidelines have been incorporated on page no. 15, 17 of chapter 1 in part 1 of ZMP. As per the mandate of the rural development department, environment conservation</p>	

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		<p>2(5) The Zonal master plan shall be prepared based on watershed approach. It shall also ensure that there is no attempt to tamper with the natural boundaries of the river and tributaries through the construction of any kind of structures on the banks of the river and tributaries.</p>	<p>and protection of water resources and watershed areas are the prime activities that are being taken in the BSEZ area. Natural Resource Management covers the points mentioned in the comment. In the present scenario more than 75% of works are being carried out in natural resource management component. Suggestion has already been incorporated in Part 1 chapter 4 Rural development page number 102.</p> <p>Clause 2(5) Watershed approach has been followed extensively in the ZMP preparation. None of the Departments construct any kind of structures which tampers the natural boundaries of the river and tributaries.</p> <p>In B.E.S.Z. there is problem of bank erosion due to flood in river Bhagirathi and its tributaries for which anti-erosion/flood protection works are proposed and constructed along the existing eroded banks without encroachment of flood plain Zone of river. Thus, these structures are proposed to facilitate protection of populated area as well as agriculture lands so that the loss of properties and habitation caused by flooding is reduced. The Detailed explanation has been given under heading Clause 2 (5) pages: 124-</p>	

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		<p>2(6) The Zonal master plan shall demarcate all the existing village settlements, types and kinds of forests, agricultural areas, fertile lands, green areas, horticultural areas, orchards, lakes and other water bodies.</p> <ul style="list-style-type: none"> The ZMP should have described in both qualitative and quantitative terms and supported by appropriate maps on say 1:5,000 or 1:10,000 scale, the denuded/degraded land areas, each water body (stream/lake/spring) and its current state, forest areas, horticulture and agriculture areas; water resources (surface and groundwater); each of the 89 villages /settlements (population and socio-economic profile), livestock population; existing road network, tourist facilities, etc. the maps included in the ZMP are clearly not on the required scale. Villages are marked as dots only. <p>In my considered view, the whole Draft ZMP should be abandoned and afresh exercise should be undertaken based on factual</p>	<p>125.</p> <p>Clause 2(6) The information related to Forest type area wise has been mentioned in pages:- 6,7 part-1 of ZMP. Agriculture & Horticulture based data has been incorporated as Annexure-46, part-3 of ZMP and the information about streams and tals has been discussed in chapter-2 of ZMP.</p> <p>The Maps of Micro-Watershed, streams, Lakes and the data available from NIH Roorkee, WIHG Dehradun etc. has been incorporated in chapter-2 in part 1 of ZMP. The suggested maps shall be considered and incorporated at the micro plan level as per requirement.</p>	

91

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		<p>situation analysis, field surveys, proper scenario building for the developmental needs of the people within ESZ, conservation needs and long-term sustainability in the wake of climate change including extreme events. The ecosystem, services of the ESZ for not only the State but the entire downstream states should be assessed objectively and in totality, and then the economic benefits accruing from conservation in the long-term even at the cost of short-term loss of a few benefits must be assessed in incorporate in the REVISED ZMP.</p>		
4	<p>Dr. D.P. Dobhal, Glaciologist, Wadia institute of Himalayan Geology</p>	<ul style="list-style-type: none"> It is observed that the physiographic (page-xxii) of the area discussed very briefly. The geological map, structure/tectonic and geomorphology maps and climate of the area are missing which are important parameters to understand the physiographic characteristic of the area. The area having fragile landscape with high snow clad mountain & steep slopes, deep valley may cause to serve different type of disaster, hence these maps are essential to understand the processes and implementation aspect. 	<p>The data received from NIH Roorkee, WIHG Dehradun etc. has been incorporated in the chapter 2 of ZMP. The detailed information about geological map and geomorphological maps and climate shall be incorporated in micro plan level or site-specific strategy level.</p>	

92

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5	Dr. Hemant Dhyani	<ul style="list-style-type: none"> Regarding maintaining the e-flow of river Bhagirathi, the compliance of ESZ notification para 3-b(xiii) which categorically says, "the existing hydroelectric power projects shall continue to operate with strict environmental compliance and social audit" is absent from the Zonal Master Plan. The plan for E-flows of Maneri Bhali I and II are not present. 	As per the Hon'ble NGT order and State government notification dated 5.06.2018, minimum 15% e-flow is being continuously released by MB-I and MB-II HEPs.	<p>The Central Government has notified the minimum e-flows to be maintained at various locations of river vide Gazette notification (S.O. 5195(E) dated 09.10.2018) and subsequent amendment dated 14.09.2019.</p> <p>Minimum e-flows to be maintained in Upper Ganga River Basin Stretch starting from originating glaciers up to Haridwar, downstream of structures or projects meant for diversion of river flows for purposes like irrigation, hydropower, domestic and industrial and other requirements, is given as under.</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Season</th> <th>Months</th> <th>% of monthly average flow observed during each of preceding 10-daily period</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Dry</td> <td>Nov. to March</td> <td>20</td> </tr> <tr> <td>2</td> <td>Lean</td> <td>October, April and May</td> <td>25</td> </tr> <tr> <td>3</td> <td>High Flow</td> <td>June to Sept.</td> <td>30</td> </tr> </tbody> </table>	Sl. No.	Season	Months	% of monthly average flow observed during each of preceding 10-daily period	1	Dry	Nov. to March	20	2	Lean	October, April and May	25	3	High Flow	June to Sept.	30
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93

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		<ul style="list-style-type: none"> No identification and adequate plan for restoration of denuded area and promotion of traditional architecture. The plan of expansion of Nagarpalika has been done without proper consideration of the ESZ notification clause 2.1, 2.8, 2.12 and 2.13. There is also massive opposition of local village panchayats in ESZ. Moreover, the expansion of the city would encourage construction along the river bank and highway side and 	<p>Identification of denuded area is already done in Working plan of Uttarkashi Forest Division and for the restoration of the same plantation scheme with its guidelines have been incorporated on page no.15, 17 of chapter 1 in part 1 of ZMP.</p> <p>After the increase in area of Nagar Palika with the incorporation of 9 GP's, expansions of the services for the residents have been increased with due consideration of ESZ notification.</p> <ul style="list-style-type: none"> No. of toilets has been substantially increased to cater the need of population increased. Proposal of 40 Km Sewage handling system under Namami Gange project, is under active 	<table border="1" data-bbox="1641 268 2163 300"> <tr> <td data-bbox="1641 268 1715 300"></td> <td data-bbox="1715 268 1843 300">season</td> <td data-bbox="1843 268 2022 300"></td> <td data-bbox="2022 268 2163 300"></td> </tr> </table> <p>The compliance of minimum environmental flow is applicable to all existing, under-construction and future projects. The existing projects, which currently do not meet the norms of these environmental flows, shall comply and ensure that the desired environmental flow norms are complied before 15th December 2019. The mini and micro projects which do not alter the flow characteristics of the river or stream significantly are exempted from these environmental flows.</p> <p style="text-align: center;">Replied by GoU.</p> <p style="text-align: center;">Replied by GoU.</p>		season		
	season							

94

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		thus is an attempt to prepare a recipe for disaster. Hence, this plan is contrary to the spirit of eco sensitive zone notification.	<p>consideration.</p> <ul style="list-style-type: none"> • Compactor machine, compost pits, segregation canters etc. Required for the Scientific Waste Management are efficiently working in the town. <p>Capacity enhancement of the existing set up and additional facilities would be created to address the future demand of waste management for incorporation of GP's in urban area, objections were invited from the GP's and grievances were duly addressed. The well-established procedure for inclusion/exclusion of GP's in Nagar Palika Parishad/ULB has been followed</p>																															
6.	Dr. Sharad Kumar Jain, Director, National Institute of Hydrology	<ul style="list-style-type: none"> • The BESZ area lacks hydrological data and hence it would be helpful if the data monitoring networks, particularly in the high altitude areas are strengthened so that the desired data for assessment, monitoring and proper management are available. 	<p>All river valley projects, river front development works or any other infrastructural work are designed and constructed after taking available hydrological data into account. These data are taken from Maneri Dam, Joshiyara Barrage and CWC Gauge sites. Depending upon the site conditions and necessity of the work, the hydrological data will be monitored and considered accordingly. Under National Hydrology Project, Irrigation Research Institute, Roorkee will install hydrological and metrological instruments in the said area.</p>	<p>CWC has recently opened 4 new sites at river Bhagirathi upto Uttarkashi. The details of the CWC Hydrological observation sites on Bhagirathi upto Uttarakashi is given as under.</p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>River/ Tributary</th> <th>Name of Site</th> <th>Type of Site</th> <th>Date of opening</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Bhagirathi</td> <td>Gangotri</td> <td>G</td> <td>05.09.2018</td> </tr> <tr> <td>2</td> <td>Bhagirathi</td> <td>Harshil</td> <td>GDS</td> <td>05.08.2018</td> </tr> <tr> <td>3</td> <td>Bhagirathi</td> <td>Gangnani</td> <td>GD</td> <td>05.08.2018</td> </tr> <tr> <td>4</td> <td>Bhagirathi</td> <td>Maneri</td> <td>GD</td> <td>05.08.2018</td> </tr> <tr> <td>5</td> <td>Bhagirathi</td> <td>Uttarakashi</td> <td>GDSQ</td> <td>15.07.1971</td> </tr> </tbody> </table>	Sl. No.	River/ Tributary	Name of Site	Type of Site	Date of opening	1	Bhagirathi	Gangotri	G	05.09.2018	2	Bhagirathi	Harshil	GDS	05.08.2018	3	Bhagirathi	Gangnani	GD	05.08.2018	4	Bhagirathi	Maneri	GD	05.08.2018	5	Bhagirathi	Uttarakashi	GDSQ	15.07.1971
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95

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		<ul style="list-style-type: none"> Quality of the water in BESZ in very good except that water carries large amount of sediments generated from glaciated areas as well as hill slopes. Pollution due to disposal of untreated or partially treated municipal waste needs to be managed. 	<p>Nagar Palika contains well thought and comprehensive waste management for door to door collection of waste, waste segregation; compaction of segregated dry waste and then which is sent to recycle plant, proper disposal of waste. Similarly, Biodegradable waste is sent for composting in the ward wise earmarked compost pits. Utmost care is given to ensure so that no waste material goes to River Ganga.</p>	<p>Replied by GoU.</p>								
7.	Dr. S. Sathya Kumar, Wildlife Expert, Wildlife Institute of India	<ul style="list-style-type: none"> Regarding hydropower development in the Bhagirathi ESZ, the recommendations made by WII in its CEIA Report (2012) need to be considered and the required environment flows has to be ensured. 	<p>As per the Hon'ble NGT order for E-flow on 9.08.2017, State government has issued an order for releasing minimum 15% of average lean season flow for dam/weir and barrage of the projects. Accordingly this has been mandatory for all the projects.</p> <p>MoWR, RD&GR issued an order vide Gazette notification no. S.O. 5195(E) dated 09.10.2018 for releasing E-flow where in the flow prescribed is more than the flow prescribed by NGT and Expert Body-II (Constituted by MoEF&CC in compliance of Hon'ble Supreme Court in the matter Civil Appeal no. 6736/ 2013).</p> <p>This order has been contested by the State Government.</p>	<p>The Central Government has notified the minimum e-flows to be maintained at various locations of river vide Gazette notification (S.O. 5195(E) dated 09.10.2018) and subsequent amendment dated 14.09.2019.</p> <p>Minimum e-flows to be maintained in Upper Ganga River Basin Stretch starting from originating glaciers up to Haridwar, downstream of structures or projects meant for diversion of river flows for purposes like irrigation, hydropower, domestic and industrial and other requirements, is given as under.</p> <table border="1" data-bbox="1646 1233 2179 1361"> <thead> <tr> <th data-bbox="1646 1233 1720 1286">Sl. No.</th> <th data-bbox="1720 1233 1850 1286">Season</th> <th data-bbox="1850 1233 2029 1286">Months</th> <th data-bbox="2029 1233 2179 1361">% of monthly average flow</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sl. No.	Season	Months	% of monthly average flow				
Sl. No.	Season	Months	% of monthly average flow									

96

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)			
							observed during each of preceding 10-daily period
				1	Dry	Nov. to March	20
				2	Lean	October, April and May	25
				3	High Flow season	June to Sept.	30
<p>The compliance of minimum environmental flow is applicable to all existing, under-construction and future projects. The existing projects, which currently do not meet the norms of these environmental flows, shall comply and ensure that the desired environmental flow norms are complied before 15th December 2019. The mini and micro projects which do not alter the flow characteristics of the river or stream significantly are exempted from these environmental flows.</p>							

97

Chapter 1: FOREST AND WILDLIFE

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
2.	Dr. Vinod Tare, Professor, Department of Civil Engineering IIT Kanpur	<p>In the clauses related to Forest & Wildlife, i.e. Clauses 2(5), as it states that the Zonal Master Plan shall be prepared based on watershed approach.</p> <p>It shall also ensure that there is no attempt to tamper with the natural boundaries of the river and tributaries through the construction of any kind of structures on the natural boundaries of the river and tributaries through the construction of any kind of structures on the banks of the river and tributaries. The above clause should be applicable within the river space.</p>	<p>The suggestions have been complied with the inclusion of a separate chapter on Watershed Management in the ZMP to achieve objective of ecological security with a watershed approach.</p> <p>The compliance to the comment has been already dealt on page no. 124 of chapter 6 in Part 1 of ZMP.</p>	Replied by GoU.

98

Chapter 2: WATERSHED MANAGEMENT

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1.	Dr. Ravi Chopra, Director People's Science institute	<ul style="list-style-type: none"> • WIHG, Dehradun, has submitted a brief situation analysis report on the "State of Glaciers in the BESZ" that makes important recommendations at the end. Despite the fact WIHG has recommended very practical action, this chapter presents no strategy or activities to deal with the challenges outlined here. • The impacts of the recession and thinning of the smaller BESZ glacier (most of which – 209 out of 238 – are small, < 5Km²) include their fragmentation, enhancing GLOF hazards. The chapter should therefore have prioritized glacier conservation activities and necessary regulations based on WIHG's recommendations. • Conclusion: The drafting committee officials have not focused on critical concerns for drying springs, environmental flows in River Bhagirathi and glaciers' melting (expressed in the General Overview) that could have been 	<p>The technical guidelines for Himalayan Glaciers inventory by SAC Ahmedabad (ISRO) issued in December 2006 shall be used for reference.</p> <p>The study related to recessions, thinning, fragmentation and conservations activities based on the WIHG's recommendations shall be in taken into account at micro plan level. However, the current possible regulatory measures like regulating tourist movement is already under implementation for Gangotri glacier.</p> <p>The concern for glacier melting has been given utmost importance in the ZMP and with respect to glacier conservation, suggestions from NIH, Roorkee and WIHG, Dehradun have been incorporated in chapter 2 "Watershed Management". To deal</p>	<p>The recommendations in the report referred by the expert may be considered and suitably incorporated in the ZMP.</p> <p>Replied by GoU.</p> <p>Macro level plans for drying springs, environmental flows in Bhagirathi and glaciers' melting may be incorporated at this stage.</p>

99

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>ideally addressed through a watershed development approach.</p> <ul style="list-style-type: none"> My earlier comment regarding the data on water availability on p.56 Pt.1 has not been addressed. There is no explanation for how the 75 per cent dependable surface water flow (presumably in R. Bhagirathi) at Maneri Bhali-I is greater than the similar flow downstream at Uttarkashi, which is prima facie unscientific. 	<p>with glacier melting, drying of springs and environmental flows (e-flows) in river Bhagirathi, activities based on watershed development approach shall be considered as suggested at the time of preparation of micro plans of the area.</p> <p>The mentioning of 75 per cent dependable surface water flow (presumably in R. Bhagirathi) at Maneri Bhali-I is quite scientific as it is based on the data received from premier institute in the field of Hydrology i.e. National Institute of Hydrology (NIH), Roorkee.</p>	<p>The comment of the expert may be addressed and incorporated in the ZMP.</p>
2.	Dr. Vinod Tare Professor, Department of Civil Engineering IIT Kanpur	<ul style="list-style-type: none"> In the chapter "Watershed Management", the section 'State of Glaciers in the Bhagirathi Eco-sensitive Zone' should be in the annexure. 	<p>The report has been annexed as Annexure 11 in part 3 of ZMP accordingly.</p>	<p>Replied by GoU</p>
3.	Prof. A.K. Gosain, Department of Civil Engineering, Indian Institute of Technology, Delhi	<ul style="list-style-type: none"> <u>Watershed Management Guidelines</u> Mere statement on livelihoods and productivity enhancement has been given but no mechanism has been put forward. We are in the habit of not evaluating our watershed management programmers in an effective manner. To start with an attempt should be made 	<p>The NGT Committee in the meeting dated 02.05.2018 clearly stated that site specific Management Plans, if prepared and incorporated in the Zonal Master Plan, at this stage, may not prove effective for future planning. Site specific Watershed management plans under the broad</p>	<p>As suggested, the evaluation of past watershed management activities may be carried out and future plans may be framed accordingly.</p>

100

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>to evaluate the past watershed developments made in this area that should be used as a benchmark to derive the future plans.</p> <ul style="list-style-type: none"> • Guidelines for Aquifer/streams/ sub-streams conservation and management <ul style="list-style-type: none"> - It is important to understand that Himalayan system is a young and fragile system, therefore it is not possible to control sediment erosion beyond the measures of checking deforestation and going in for afforestation. The other structural measures proposed in the plan should be kept to minimum and the tendency to control the streams and channelize them be curbed. - It is important to undertake the flood plain zoning in this 	<p>purview of Zonal Master Plan shall be prepared in future on a participatory approach involving local people.</p> <p>The suggestion is well taken. It is however clarified that the Soil and Moisture conservation strategy in the ZMP has been proposed to a minimum scientifically unavoidable area.</p> <p>Keeping in view the young and fragile nature of Himalayan ecosystem, micro watershed area of 113 streams was initially mapped through GIS and classified into six classes as per the classification of Central soil and Water Conservation Research and training Institute, Dehradun. Out of the total area of 417900 ha, 11697 ha of area below 3500 meters of altitude fall into moderate severe, severe and very severe soil erosion classes (More than 15 tons per hac. per year of soil loss).</p> <p>The exercise of flood plain zoning is already in process and has been</p>	<p>Replied by GoU</p> <p>Replied by GoU</p>

(101)

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>stretch. They should become the basis to decide as to which are the areas that prone to flooding and should not be allowed for any habitation. If there have been settlements in these areas then this is the right time to reallocate them with appreciable compensation rather than keep investing in structural measures as well as keep giving them false security.</p> <p>- As far as agriculture land in the frequently flooded area is concerned, it is always known to the locals that it is to be used only during the non-monsoon period. Therefore, there is no requirement of providing the structures to avoid inundation of such lands.</p>	<p>discussed on page no. 125 of chapter 6 in part 1 of ZMP</p> <p>The crop in the area is mainly rain fed and irrigation dependent, the crop can't be raised in non-monsoon period in the hilly area like Uttarkashi, where the extreme weather condition provides only limited window to raise specific crops.</p>	<p>Activities in the frequently flooded areas should be regulated as per recommendation of Flood Plain Zoning.</p>
4.	Prof. Brij Gopal	<ul style="list-style-type: none"> As far as Lakes (Tal) are concerned, the chapter on forests mentions 14 lakes and includes a location map on p.34. The chapter on Watershed lists 13 lakes along with their location. The lists of 13 lakes in vol. 1 and vol. 2 do not match. Gaumukh and Bhutal are noted in Vol. 1 only whereas Kana tal and Sattal are listed only in Vol. 2 and budget for catchment treatment 	<p>The list of lakes on part 2 is same as list of lakes on page no. 74 of part 1. However; the lake Bhutal has been missed out from this list. In list of lakes on page no. 62 of part 1 has mentioned Gaumukh as a lake which is editing error and will be rectified. Similarly mentioning of Kanatal, Sattal has been missed out in this list which will be incorporated</p>	<p>Replied by GoU</p>

102

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>has been also mentioned for these two. There is no information given on the biophysical characteristics of any of these lakes or their immediate catchment.</p> <p>The area of the lakes given of page 74-75 casts doubt about its correctness because a 100 sq. m (0.01 ha.) water body (the Braham tal) cannot be identified and measured accurately without very high-resolution satellite images. No information is provided in the methodology and images used.</p> <ul style="list-style-type: none"> The ESZ notification required that under 'Natural Heritage', valuable sites particularly those of scenic beauty, confluence points of river, waterfalls, pools, springs, gorges, groves, caves, open areas, wooded areas, points, walks, rides, etc., shall be identified and all the gene pool reserve areas in the Eco-sensitive Zone shall be preserved. While the DRAFT ZMP lists sites like Bhugyals, Lakes (Tal), and streams, none of the other important area such as springs, gorges, groves caves and river confluences have been listed, 	<p>accordingly. The total lakes in BESZ are 14, which are Dodital, Khedatal, Bhamajatal, sahestratal, Kana tal, sattal, Brahmtal, table top tal, basukital, Sonamtal, tapovantal, Kedartal, janaktal, Bhutal. The correction shall be incorporated accordingly.</p> <p>The area of the lake (Braham tal) has been taken through GIS by IT Cell of Forest department.</p> <p>The listing and mapping related to specific sites like waterfalls, caves etc. shall be considered at micro plan level.</p>	

103

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		mapped and described for their possible conservation.		
		<ul style="list-style-type: none"> The proposed interventions for de siltation, shoreline stabilization with macrophytes, and catchment treatment (Contour trenches/ Bunds/ Terraces; Gully Plugging; percolation pits; and plantation of grass and shrubs, noted in volume 2) are without any basis or minimal understanding of these systems or that of any high-altitude lake ecosystem. 	<p>The proposed interventions of catchment treatment like Gully plugging; percolation tanks, plantation, etc., have been prescribed on the basis of Working Plan of Uttarkashi Forest Division and Management Plan of Gangotri National Park. The working plan is a scientific document formulated as per the National Working Plan Code and is duly approved by MoEF&CC, Govt. of India and activities prescribed under this are based on intensive enumeration exercises and ground truthings and verifications done by the forest field staff and Working Plan Officer. Therefore, the soil & moisture conservation intervention prescribed according to principles of watershed management.</p>	Replied by GoU
		<ul style="list-style-type: none"> Similarly, the DRAFT provides a list drainage system (streams/gads) but there is no information whatsoever on the river channels, their banks or floodplains, their water quality or biodiversity in the absence of any basic information on the problems faced by the river system, none of the interventions can be justified or 	<p>The micro level site specific details for drainage system shall be incorporated at the time of site specific DPR preparation based on ground truthing. As discussed in "Watershed guidelines" and elsewhere in Chapter -2, the estimates may vary in future as per site specific scenario.</p>	

104

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
		evaluated. The budget provisions for assume activities some of which are against the spirit of the ESZ notification are at best arbitrary.		
5.	Dr. D.P. Dobhal, Galciologist, Wadia Institute of Himalayan Geology	<ul style="list-style-type: none"> Water resource-total water availability and distribution in the area has not been discussed in detail which are important aspects while addressing the water resource management. Report on State of Glaciers in the BESZ (submitted by WIHG) is significant on the subject, but the present chapter neither any concluding comments made on its observations and recommendations, nor outlined a strategy to deals the future challenges. Likewise, other water resources like springs, lakes and ground water are completely missing in the chapter. However, few lakes are listed in Table, (pp 62-63 and most of them are glacial lake (supraglacial) which is unstable lake. The Gangotri glacier from where River Ganga emerged. Further, Drainage (Surface water) map of the all watershed is well illustrated, but distribution” of perennial, seasonal and dry stream are not classified/demarked. The Soil map and Soil erosion is discussed well. 	<p>The total water availability and distribution as provided by NIH, Roorkee has been incorporated on page no. 56 in part 1 of ZMP. The relevant information regarding ground water, usage, lakes and springs was requested from NIH, IIRS, WIGH Dehradun, etc. The information provided by the institutions was accordingly incorporated on page no. 77 & 78 of chapter 2 and in Annexure 11. The strategies at the micro plan level will be made on basis of suggestions received form NIH Roorkee, WIHG; Dehradun.</p> <p>List of streams along with their nature (perennial/dry or seasonal) has been provided in the chapter.</p>	Replied by GoU

105

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
6.	Dr. Hemant Dhyani	<ul style="list-style-type: none"> Watershed management chapter shows the map on the basis of survey report of 'National bureau of soil survey and land use planning' Nagpur, which reveals that area along the river/tributaries and highway is under severe soil-erosion. Moreover, it does not give the specific details of water availability and impacts on the health of water resources like how many have been dried up, situation of water discharge etc., There is no scientific explanation and justification of the treatment methodology and there is an absence of the plan for active participation of village panchayats and local community. 	<p>The site-specific study related to specific water availability and impact on health of water resources shall be considered at the time of execution for micro watershed level micro plans.</p> <p>The treatment methodology is based on the prescriptions directed in the working circle of the Working Plan of Uttarkashi Forest Division, which is approved by MoEF& CC, Govt. of India. The identification & mapping of watershed has been done on scientific basis and structures have been prescribed based on working plan of Uttarkashi Forest Division and Management Plan of Gangotri National Park. The public participation shall be incorporated at micro planning stage.</p>	
7.	Shri Chandi Prasad Bhatt, Environmentalist	<ul style="list-style-type: none"> Vegetative measures should be given priority for the conservation and protection of 	Prescription for gully plugging by vegetative means (Brushwood/ Pirul check dam) has been proposed on	Replied by GoU

106

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>mountain streams and springs. Mechanical measures should be minimal and regeneration should be encouraged. Various measures for treatment of the recharge Zones of springs must be recommended based on the local conditions.</p> <ul style="list-style-type: none"> • Great caution should be observed for the conservation of streams flowing by old or glacial debris. The work plans must have provision for their conservation. • Stones may be used for protection walls to protect the banks of streams and farm lands from being eroded by water (of mountain streams and rivers and rain). But there must be provision for not digging the mountains or river banks (i.e., provision for bringing material from outside). 	<p>page no. 76 in chapter 2 of ZMP. Similarly, ANR (Assisted Natural Regeneration) works have been prescribed in Chapter 1.</p> <p>Site specific provisions shall be incorporated at micro plan preparation level, as it is not possible to incorporate every site specific detail in the ZMP.</p> <p>Stones wire crate and Gabion are used as protection walls to protect the banks of streams and farm lands from being eroded by water.</p> <p>If the River Bed Material (RBM) is transported from the outer area to cater the genuine demand of locals, the carbon footprint and the environmental impact would be on the higher side. It's to be added further that environmental concerns are duly being addressed while permitting every individual case of the RBM extraction.</p> <p>The Extraction of River Bed Material</p>	

107

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
			<p>(RBM) up to a 2 m depth cannot be done unless the compliance of the following points is covered.</p> <ul style="list-style-type: none">• Joint Inspection with Forest and other Departments.• Geological survey by Mining Department.• Environment Impact Assessment.• Clearance from Pollution Control Board.• Necessary to improve carrying capacity of river or stream, so that maximum flood discharge can pass safely i.e.; without inundation and optimum bank erosion.• Important terms and conditions are there for regulated mining, like: -Appointment of Task force for Inspection of Extraction of River Bed Mining etc.	

108

Chapter 3: AGRICULTURE AND ALLIED SECTOR

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
1.	Dr. Ravi Chopra Director People's Science Institute	I do not see any reference on pp. 95-96 Pt 1 to my suggestion for construction of farm ponds in place of roof rain water harvesting under PMKSY to improve agriculture yields as stated in the Compliance Report (Pt 3, p 280)	It is pertinent to mention here that under PMKSY and other departmental schemes, both farm ponds and rain roof water harvesting structures are being constructed for providing irrigation facilities, however, suggestion has been incorporated in future strategy under PMKSY (<i>Har khet ko Pani</i>) and MGNREGA in Chapter 3-part1-page no. 95 to 96.	Farm Ponds have been mentioned at page 102 under MGNREGA.
		The coverage of lift irrigation can be massively increased by apportioning to it a small fraction of all the hydropower generated in Uttarkashi.	Suggestion has been incorporated in future strategy under PMKSY in Chapter 3, part-1, page no. 95 to 96.	There is a mention of taking up lift irrigation under Boarder area Development Programme (BADP) on page 107.
3.	Dr. D.P. Dobhal Glaciologist Wadia Institute of Himalayan Geology.	<ul style="list-style-type: none"> Irrigation system in the area is very poor where more attention is required for proper development of irrigation sector in term of mapping of terrain in term of slope stability, water availability (stream, springs and rivers) and soil erosion in each watershed, but this part has not discussed in the plan. 	It is pertinent to mention here that under the various departmental schemes like PMKSY, irrigation facilities are being developed over the years by construction of farm ponds, irrigation channels, roof-top rain water harvesting structures as per the suitability of the area. Further, detailed plan will be incorporated in the area specific micro plan. However, Suggestion has been incorporated in future strategy under PMKSY (<i>Her khet ko Pani</i> and <i>Per drop more crop</i>) in Chapter 3-part-1-page no. 95 to 96. Further detailed watershed plans will be incorporated in the area specific micro plan.	

109

Chapter 4 : RURAL DEVELOPMENT

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
	Dr. Ravi Chopra,	Future strategy: In response to an earlier suggestion that the critical activity of reviving dried or dying springs be undertaken near habitations, rejuvenation of water sources has been included in the present scenario section. Springs revival has not been specifically mentioned. Technically this activity is different from routine rain water harvesting of the kind mentioned on p. 102 Pt 1. Springs' restoration measures are undertaken in a limited springs shed area and they recharge the underlying aquifers. By doing so, they enhance the base flows of the rivers during the year. Given that maintain environmental flows of Bhagirathi river is a key objective of the proposed ZMP, these aspects need to be properly understood, scientifically planned and then implemented.	Natural Resource Management is the most important component of MGNREGA schemes. Under this scheme water conservation, water harvesting, water recharge points, afforestation works are taken on priority and all these are eventually leading for revival of all water sources and springs rejuvenation for drinking and irrigation purposes also helping environmental flows of Bhagirathi river. Thus helping in maintaining the environmental sustainability and livelihood support mechanism in the ZMP areas. At present, 75 percent of MGNREGA activities are Natural Resource Management activities which are as per the essence of BESZ master plan.	Replied by GoU
		Proposals made by committee members to promote solar or micro-hydel energy to lift water for domestic supply or irrigation, with the help of UREDA, did not find much favour with the ZMP drafting group. This	The Nelong valley micro-hydel unit mentioned in chapter 4 Rural development is of BADP programme. Uttarakhand Renewable Energy Development Agency (UREDA) is implementing various projects which are	Replied by GoU

110

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		could strengthen decaying farmers' managed irrigation systems. Instead, however, the department officials are content with obtaining UREDA's support for one micro-hydel unit in the remote Nelong Valley mainly for the benefit of the security forces stationed there. The differences between the outcomes of the two proposals are lost upon the minds of department officials.	discussed in detail in chapter no . 07 (Energy).	
	Dr. Brij Gopal, Founder & President, National Institute of Ecology.	The Zonal master plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention.	As per the mandate of the rural development department, environment conservation and protection of water resources and watershed areas are the prime activities that are being taken in the BSEZ area. Natural Resource Management covers the points mentioned in the comment. In the present scenario more than 75% of works are being carried out in natural resource management component. Suggestion has already been incorporated in Part 1 chapter 4 Rural Development page number 102. (Provision for restoration of denuded areas has been included at page 4, 15-16 of Part 1)	Replied by GoU

(111)

Chapter 5 : URBAN DEVELOPMENT

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1.	Dr. Ravi Chopra, Director People's Science Institute	<p>Urban Development in the BESZ required integrating the plans of different departments to provide good quality basic urban services so that a comprehensive plan of urban development emerges in this chapter. This has not been done despite earlier recommendations of the committee members and the central government. The new draft again focuses only on solid waste management (SWM) and education facilities in Uttarkashi (Barahat Nagar Palika) and Gangotri (Nagar Panchayat) towns. The proposed Master Plan for the Urban areas need to be completed urgently and incorporated in the ZMP.</p> <p>• The responses on p. 285 Pt 3 to</p>	<p>Integration of plans within BESZ.</p> <ul style="list-style-type: none"> Nagar Palika is committed to ensure integrated and holistic development of urban areas within BESZ. Various flagship programs of Central government and state government are already being implemented covering multiple aspects of urban life. Housing is being covered under "Housing for All" and the toilets constructed in these houses are integrated with SBM (Swachh Bharat Mission). Also the domestic waste generated in such houses is taken care under solid and liquid waste management. Common facilities such as road street lights, cleaning, fogging is provided by NPP. <p>Master plan for urban area in BESZ</p> <ul style="list-style-type: none"> The Master Plan is in consideration of the chief town and country planning department of Uttarakhand and it will be incorporated in the ZMP as and when it is approved by housing department Uttarakhand. <p>The Recommendation of honorable</p>	Replied by GoU

112

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>the earlier comments related to the following are poorly written and hard to understand</p>	<p>member has been considered and rectified accordingly. Nagar Palika is committed to ensure integrated and holistic development of urban areas within BESZ. After inclusion of 9 GP's population within the limit of Nagar Palika Parishad Barahat Uttarkashi is 27102 as per this increase all the Urban Infrastructures are to be strengthened accordingly i.e. Water supply, Sanitation/ Sewerage Treatment and Disposal, Scientific Waste Management, Urban Transport, Housing need of the town etc. are to be taken.</p> <p>Under Swachh Bharat Mission, following activities and schemes are under implementation.</p> <ol style="list-style-type: none"> 1. As per the town need and applications from the beneficiaries 140 IHHL (Individual House Hold Latrines) has been constructed. 2. 40 Seat Community/Public Toilets has been constructed. 3. Under solid waste management door to door collection of waste has been started by ULB in all the 11 wards of the town. 4. Nagar Palika as per "polluters to pay principle", user charges bylaws has been notified by the ULB. 5. As per the provision of Anti Littering 	

113

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>- Though the NPP Uttarkashi area will expand, there appears to be no expansion of the services to be provided to the increased population. New initiatives on SWM under the Swachh Bharat Mission have been identified on p.284, Pt 3 but they are not included in the</p>	<p>and Anti Spitting Act 2016, Rs. 56350.00 has been collected from the violators. 6. Plastic compactor unit is installed in ULB Barahat Uttarkashi. 7. Uttarkashi Town has been self-declared ODF (Open Defecation Free) as per the process of Swachh Bharat Mission Guide Line. 8. Nagar Palika Parishad Barahat Uttarkashi has initiated the process of allotment of land for safe scientific disposal of solid waste. After that DPR shall be prepared with the provision of scientific treatment and disposal of MSW as per SWM rules 2016. 9. For floating population no. of dustbins are increasing. DDA mandate is to regulate and to approve the construction of Earthquake resilient buildings. The government buildings are made differently-able friendly by incorporating ramps etc. in government and similar other building.</p> <p>After the increase in area of Nagar Palika with the incorporation of 9 GP's, expansions of the services for the residents have been increased.</p> <ul style="list-style-type: none"> • No. of toilets has been substantially increased to cater the need of population increased. • Proposal of 40 Km Sewage 	<p>Replied by GoU</p>

114

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		<p>text of the draft chapter under review. This shows a cut-and-paste approach to the revision.</p> <p>The present draft provides information about the SWM infrastructure in the towns but is silent on the outcome. This data does not take into account the floating population. This may explain the presence of garbage heaps in Uttarkashi and solid waste dumped in dry stream beds during the summer tourist season as described by Sh. C.P. Bhatt in the meeting of 9th Dec 2017. No plan to promote decentralized waste management and thereby decrease the pressure of land requirement, as mentioned in page-115, is included as a future strategy. This had been suggested</p>	<p>handling system under Namami Gange project, is under active consideration.</p> <ul style="list-style-type: none"> • Compactor machine, compost pits, segregation centers etc. Required for the Scientific Waste Management are efficiently working in the town. • Capacity enhancement of the existing setup and additional facilities would be created to address the future demand of waste management. <p>Decentralized waste management plan includes following:-</p> <ul style="list-style-type: none"> • Door to door collection in all 11 ward has started. • Segregation of solid waste at source. • Dry waste segregation to segregate plastic waste • Segregated plastic is compacted via compactor and is sent to recycling plant. • Biodegradable waste is dispatched to earmarked compost pits for disposal. • Domestic liquid waste is treated in STP's. <p>NPP Barahat is efficiently working</p>	<p>Replied by GoU</p>

115

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
		<p>by Dr. Tare at an earlier meeting.</p> <p>- Even though the Swachh Bharat Mission identifies awareness generation, behavioural change and people's participation in the mission in its objective, the proposed activities have ignored these aspects.</p>	<p>in all these aspects.</p> <p>Following measures are being taken for mass awareness, behavioural change and people's participation-</p> <ul style="list-style-type: none"> • Mohalla wise morning awareness campaign. • Cleanliness school marshals – they collect dry waste from their home and deposit it in their school on a particular day of week. • Segregated waste collections in government colonies have been started. • Ward wise compost pits • Total ban on plastic within limits of BESZ • Cleanliness campaign in the town with active participation of community. 	<p>Replied by GoU</p>
2.	<p>Dr. Vinod Tare, Professor, Department of Civil Engineering, IIT Kanpur</p>	<ul style="list-style-type: none"> • Referring Swachh Bharat Mission, it is stated that instead of describing programme wise, this chapter should give strategy for provisioning water and sanitation (toilets, solid and liquid waste management). Again guiding principles (zero waste discharge to water bodies and minimum land 	<p>Decentralized Solution for waste management in BESZ:-</p> <ul style="list-style-type: none"> • Zero waste discharge to water bodies by treating liquid waste generated by house hold under Namami Gange project. • Expansion of sewage system- 40 km sewage line is under construction and till now 10 km 	<p>Replied by GoU</p>

116

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		filling). Also emphasis should be how decentralized solutions will be planned and executed. Something on how to make it sustainable.	line has been laid. • Capacity up gradation of existing STP in BESZ has been completed.	
3.	Dr. Hemant Dhyani	<ul style="list-style-type: none"> Urban Development: Mentioned above as a major concern. Moreover a concrete solid waste management plan is lacking. All waste material is going directly into Ganga. 	<p>Nagar Palika has well thought and comprehensive waste management plan for disposal of waste material. Nagar Palika collects waste, segregate, and segregated dry waste is compacted. The compacted dry waste is sent to Recycling plant. Similarly, Biodegradable waste is sent for composting in the ward wise earmarked compost pits.</p> <p>Utmost care is given to ensure so that no waste material goes to River Ganga. Out of 14 drains, 5 drains have already been tapped into STP System. 7 drains are seasonal in nature but even they too are already been screened to stop the flow of drain water directly into the river.</p>	Replied by GoU

117

Chapter 6 : Irrigation

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1.	Shri. Brij Gopal	<p>The plan of Irrigation Dept envisages "river training works such: River Channelization, Flood protection works, Anti Erosion Schemes/Slope Stabilization etc. shall be under Regulated Category (page 125). The Dept refers to the provision under para 3c (viii) of the ESZ notification, added through the amendment of 16/17 April 2018.</p> <p>River training works such as river channelization and flood protection wall cannot be considered under disaster mitigation and constitutes a total misinterpretation of the ESZ provision.</p>	<p>Para 3 (c) (viii) of Notification S.O. 1656 (E) Dated 16th April, 2018 states that: - Works related to re-construction, disaster mitigation, lift Irrigation, hospitals, schools, food go-downs, and other social and national security infrastructures, shall be carried out with due study of Environmental Impacts and complying with their mitigation options.</p> <p>As per Section 34 of Disaster Management Act-2005, District Authority has the power to order any department for construction of necessary structures required for protecting the life and property of the people and under which River training works such as:- Flood Protection works, River Channelization etc. can be done for protection of Populated and Agriculture area. The above works has been kept under Regulated Category given in page-125, chapter-6, part-1 of ZMP.</p> <p>In the said stretch of river, the velocity of flow is very high at maximum flood</p>	<p>As per the Flood Plain Zoning notification vide no. 829/II(2)- 2018/06(66)/2016 dated 11.05.2018 for reach upto 10 km from Gangotri to Badethi Chungi in river Bhagirathi of Uttarkashi districts, flood management activities have been kept as permissible activity.</p> <p>Flood being the most common natural Disaster, flood management activities come under the purview of Disaster mitigation, however, flood management activities should be kept under</p>

118

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>A 2-meter deep channel dredged into the river Bhagirathi or its tributaries will destroy the river system completely. Removal of river bed material (RBM) may be required only, when there is an extreme flood even or when the river's space on its floodplain is usurped and hence, the movement of this material is prevented both laterally and longitudinally. Any attempt to dredge the river channel will completely negate the very objectives of the ESZ – the "maintenance of environmental flow and ecology of the river Bhagirathi from</p>	<p>discharge (6 m/s to 15 m/s depending on the longitudinal slope and waterway). High velocity of flow causes bank erosion. If river training work such as Retaining wall along the eroded river bank is not constructed at vulnerable reaches, the slope of the bank will become steeper, there may be more chances of failure of slope i.e. land slide.</p> <p>If the River Bed Material (RBM) is transported from the outer area to cater the genuine demand of locals, the carbon footprint and the environmental impact would be on the higher side. It's to be added further that environmental concerns are duly being addressed while permitting every individual case of the RBM extraction.</p> <p>The Extraction of River Bed Material (RBM) up to a 2 m depth cannot be done unless the compliance of the following points is covered.</p> <ul style="list-style-type: none"> • Joint Inspection with Forest and 	<p>regulated activities.</p> <p>Replied by GoU</p>

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		Gaumukh to Uttarkashi"	<p>other Departments.</p> <ul style="list-style-type: none"> • Geological survey by Mining Department. • Environment Impact Assessment. • Clearance from Pollution Control Board. • Necessary to improve carrying capacity of river or stream, so that maximum flood discharge can pass safely i.e.; without inundation and optimum bank erosion. • Important Terms and condition are there for regulated mining, like: - Appointment of Task force for Inspection of Extraction of River Bed Mining etc. <p>Hence from above it implies that it would neither impact the river nor based on demand.</p>	
4.	Dr. Hemant Dhayani	Need a conservation plan of springs of each and every village	<p>Natural Resource Management is the most important component of MGNREGA schemes. Under the scheme water conservation, water harvesting, water recharge points, afforestation works are taken on priority and all these are eventually leading for revival of all water sources and springs for drinking and irrigation</p>	Replied by GoU

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>Ganga-Ghats and protection walls should be designed traditionally and aesthetically by the best architects in an eco-friendly manner. A survey by an external agency of experts for analyzing the quality of river-channelization, flood protection works etc. should be done.</p> <p>No commercial extraction of river water or ground water should be permitted in the ESZ. The local level expert committee should be consulted for other works of the department.</p>	<p>purposes. Thus, helping in maintaining environmental sustainability and livelihood support mechanism in the ZMP areas.</p> <p>The maintenance/restoration of Ganga-Ghats are aesthetically designed by the department in the manner to promote traditional culture of local people. The details have been incorporated in page 125, part-1 of ZMP. Projects related to river-channelization; flood Protection works etc. are approved by Technical Advisory Committee of Uttarakhand. These projects are prepared after taking necessary environmental and other mining aspects. So, these projects don't require external agency.</p> <p>No commercial extraction of river water or ground water is being proposed by the department.</p>	<p>Replied by GoU</p> <p>Replied by GoU</p>

(121)

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
5.	Prof. A.K. Gosain	<p>It is important to undertake the flood plain zoning in this stretch. This should become the basis to decide as to which are the areas that are prone to flooding and should not be allowed for any habitation. If there have been settlements in these areas then this is the right time to relocate them with appreciable compensation rather than keep investing in structural measures as well as keep giving them false security.</p> <p>As far as agriculture land in the frequently flooded area is concerned, it is always known to the locals that it is to be used only during the non-</p>	<p>Government of Uttarakhand has enacted "Uttarakhand Flood Plain Zoning Act-2012 vide Notification No.31/XXXVI (3)/2013/68(1)//2012 Dated 28 January 2013 to demarcate the flood plain areas and to declare the use of land Prohibited, Regulated and permitted. Where, the flood plain includes water channel, 25, 50, 100-year return period flood and adjoining area which is susceptible to erosion or Maximum Probable Flood. Government of Uttarakhand has implemented Flood Plain Zone on 10 km stretch from Gangori to Badethi Chungi in District Uttarkashi, while in the remaining stretch of ESZ, Flood plain Zone study work has been completed and currently the field demarcation work is in progress. The Detailed explanation has been given under heading Clause 2 (5) pages: 125.</p> <p>Most of the susceptible areas of settlements in ESZ has been protected by anti-erosion works.</p> <p>In BESZ, Agriculture area is mostly used in kharif season for cultivation i.e. in Monsoon period. Anti-erosion works are provided where the area is highly susceptible to inundation.</p>	<p>Replied by GoU</p> <p>Replied by GoU</p>

122

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		monsoon period. Therefore, there is no requirement of providing the structures to avoid inundation of such lands.		
6.	Prof. A. K. Gosain	<p>It is important to explore alternate mechanism of irrigation since our conventional methods of irrigation are having very low water use efficiency. It is also not desirable to have the irrigation canals/channels in this fragile and sensitive system.</p> <p>Therefore, sprinkler and drip method should only be used with the ground water and all the investments proposed for making and maintaining the irrigation infrastructure should be diverted towards establishing the drip and sprinkler systems.</p> <p>Only traditional crops should be promoted to avoid the excessive water demands.</p>	<p>Livelihood of local inhabitants in Bhagirath ESZ depends on agriculture and rice is the main traditional crop of these people. Total water requirement of rice is more than that of other crops and irrigation for these crops is totally dependent on canals/channels.</p> <p>Sprinkler and drip irrigation methods have been incorporated in page-47, part-2 of ZMP</p>	Replied by GoU. However, techniques with high water use efficiency (such as piped irrigation / drip /sprinkler) and less water consuming crops should be promoted / adopted wherever feasible.
		An explanation has been provided by the irrigation department to allow deviation from the Clause 2(5) of the notification (page 124), which does not	Government of Uttarakhand has enacted "Uttarakhand Flood Plain Zoning Act-2012 vide Notification No.31/XXXVI (3)/2013/68(1)//2012 Dated	Replied by GoU

123

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>seem to be applicable in the present case. This stretch is a deep valley and has no chance of meandering from its path. Therefore, if we do not let the very small extent of available flood plains encroached there shall remain no requirement of all the measures the department is planning for.</p>	<p>28 January 2013 to demarcate the flood plain areas and to declare the use of land Prohibited, Regulated and permitted.</p> <p>In compliance of Flood Plain Zoning Act-2012, Flood plain zone for 10 Km stretch from Gangori to Badethi Chungi in Uttarkashi District has been notified. Dharali, Jhala, Mukhwa, ongi, Heena, Netata etc. are the few places in ESZ where huge accumulation of RBM can led to meandering of river, so without having any concerned expert it would be hard to say that meandering of river will not occur.</p> <p>The Detailed explanation has been given under heading Clause 2 (5) pages: 124-125.</p>	
7.	Shri Chandi Prasad Bhatt	<p>Stones may be used for protection walls to protect the banks of streams and farm lands from being eroded by water (of mountain streams and rivers and rain). But there must be provision for not digging the mountains or river banks (i.e.; provision for bringing material from outside)</p>	<p>Stones wire crate and Gabion are used as protection walls to protect the banks of streams and farm lands from being eroded by water.</p> <p>Clause 3 (a) (iii) of Notification states about Mining of Mineral and stone quarrying and crushing.</p>	Replied by GoU

124

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
8.	Dr. D. P. Dobhal	Irrigation system in the area is very poor where more attentions are required for proper development of irrigation sector in term of mapping of terrain in term of slope stability, water availability (streams, springs and rivers) and soil erosion in each watershed, but this part has not discussed in the plan	Proposed for improvement of Irrigation system in next 15 years so that it can enhance the current Irrigation Potential Utilized in ESZ has been given in Part-2, page 48-50 of ZMP.	Replied by GoU

125

Chapter 7 : ENERGY

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
1	Dr. Ravi Chopra , Director People's Science Institute	<ul style="list-style-type: none"> • UREDA's proposals to install 10 MHP's with the involvement of PRIs and to distribute LED lights and bulbs for demand side management are also highly appreciated as are its other innovative proposals to upgrade water mills generating electricity, install solar street lights, roof top grid interactive solar power plants (4-5KW) for 500 families, mobile solar cold storages, 50 solar dryers and 250 biogas plants. • In addition the following points are to be noted: <p>(i) On p. 131 it is mentioned that, "...5 large and medium hydro-projects of total installed capacity 1651 MW and investment potential of Rs. 7697 crore have been put on hold by the decisions of NGRBA dated 1.11.2010 and Hon'ble supreme court in the matter of civil Appeal no. 6736/2013 dated 13.08.2013 respectively." A correct statement would be that three of these projects (Bhaironghati 381</p>	<p>Harnessing of Renewable energy sources available in the BESZ is the top priority of State Government after approval of master plan, micro plan will be prepared as per the available resources in the area.</p> <p>(i) It is to clarify that in the 2nd Meeting of NGRBA, decision was taken to discontinue 3 Projects i.e. Bhaironghati, Loharinag-pala and Pala Maneri totaling of 1461 MW. Hence the comment of Hon'ble member is agreed to above extent.</p>	<p>Replied by GoU</p>

126

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>MW, Loharinag-Pala 600MW and Pala-Maneri 480 MW) were cancelled (not put on hold) by the 1.11.2010 decision of NGRBA.</p> <p>(ii) Carrying capacity studies (p. 132, pt 1) are highly multi-disciplinary. In one of the NGT committee meetings, Dr. Tare and I expressed our lack of confidence in the ability of IIT-R and NIH alone to carry out such a study in the BESZ. A large consortium including organizations like FRI/ICFRE, WII, TISS (Mumbai), etc. would be required to adequately address the various relevant disciplines.</p> <p>(iii) Reference to the 'losses' (such as at p. 133 pt 1) due to the cancellation of the 10 SHP's (actually 9, since the Suwarigad 2 MW project has been retained) need to be avoided, since alternatives like development of solar power, biogas, demand side management, reducing T&D losses, etc. are permitted and some have been proposed. While</p>	<p>(ii) As hydro-projects more than 2MW capacities are not taken up in Master plan of BESZ. Hence there is no need for further doing carrying capacity studies for such projects. However, it is to clarify that in view of multidisciplinary studies apart from IIT-Roorkee and NIH, services of Forestry & Natural Resources and Environmental Sciences departments, HNB Garhwal University were also taken. In addition to this services of individual subject matter experts were also taken.</p> <p>(iii) The state is constantly suffering from revenue loss and development disability due to stalled HEP's in BESZ and the State Government has repeatedly requested Gol for the Green Bonus in lieu of environmental services provided by the State of Uttarakhand.</p>	<p>Replied by GoU</p> <p>Replied by GoU</p>

128

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)								
		<p>(vi) Reference has been made on p. 137, Pt 1 to release of 15% E flows in compliance with an order of the NGT. This figure has no scientific validity. It is well-known that E Flows must mimic the natural flows of a river and are therefore a regime of flows rather than a single value. Also the figure is well below the values determined by the IITs-Consortium. It needs to be significantly revised upward for the BESZ.</p>	<p>made part of any recommendation for implementation.</p> <p>In compliance of Hon'ble NGT order for e-flow on 9.08.2017, State Government vide order dated 5.06.2018 has issued directions for releasing minimum 15% of average lean season flow for dam/weir and barrage of the projects.</p> <p>MoWR, RD &GR issued an order vide Gazette notification no. S.O. 5195(E) dated 09.10.2018 for releasing E-flow, where in the flow prescribed is more than the flow prescribed by NGT and Expert Body-II (Constituted by MoEF&CC in compliance of Hon'ble Supreme Court in the matter Civil Appeal no. 6736/ 2013).</p> <p>This order has been contested by the State Government on the ground that the release recommended by MoWR are on higher side. Any upward revision in environmental release shall be considered after decision of MoWR as the case may be.</p>	<p>The Central Government has notified the minimum e-flows to be maintained at various locations of river vide Gazette notification (S.O. 5195(E) dated 09.10.2018) and subsequent amendment dated 14.09.2019.</p> <p>Minimum e-flows to be maintained in Upper Ganga River Basin Stretch starting from originating glaciers up to Haridwar, downstream of structures or projects meant for diversion of river flows for purposes like irrigation, hydropower, domestic and industrial and other requirements, is given as under.</p> <table border="1" data-bbox="1787 1161 2154 1370"> <thead> <tr> <th data-bbox="1787 1161 1827 1370">S I N O</th> <th data-bbox="1827 1161 1921 1370">Season</th> <th data-bbox="1921 1161 2056 1370">Months</th> <th data-bbox="2056 1161 2154 1370">% of monthly average flow observed during each of preceding 10-</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	S I N O	Season	Months	% of monthly average flow observed during each of preceding 10-				
S I N O	Season	Months	% of monthly average flow observed during each of preceding 10-									

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
		<p>the latter proposals do not amount to 80.5 MW (the capacity of the 9 cancelled projects), they can be increased.</p> <p>As regards the estimated loss of revenue to the state exchequer, at each committee meeting it was recommended that GoU should demand from Gol a payment for ecological services (PES) rendered by the conservation activities in the BESZ. This recommendation has not been followed up.</p> <p>(iv) There are discrepancies between the figures given in the table for Physical and Financial Status of Proposed SHP's in BESZ' in the latest draft and in the earlier draft (April 2018). This table and the one above it (p. 134 Pt 1) can be dropped or modified.</p> <p>(v) The section on Observations on BESZ Notification (p. 137, Pt 1) is irrelevant and should be dropped.</p>	<p>In the initial draft, 10 SHPs in the BESZ were detailed out. Subsequently, as per decisions taken in the different meetings, GoU has taken a stand to take up projects upto 2 MW in the BESZ and therefore, now only Suwarigad SHP (2 MW) has been mentioned in the annexure.</p> <p>The observations given on the page 137 are about the facts related to the MoEF&CC notification dated 18.12.2012 for BESZ and other Eco-Sensitive Zones notification issued for different states. The details are given for updated information and if any contradiction is reported, the same can be clarified with support information. This has not been</p>	<p>In view of the reply of GoU, tables showing list of proposed HEPs in BESZ may be modified accordingly.</p> <p>Replied by GoU</p>

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							daily period
				1	Dry	Nov. to March	20
				2	Lean	October, April and May	25
				3	High Flow season	June to Sept.	30
		(vii) Shri Chandni Prasad Bhatt had made a recommendation for upgrading the Harsil HEP to 0.8 or 1.0 MW, along with the	(vii) As per the recommendation of Hon'ble member, the capacity of Harsil HEP is being upgraded from 200 KW to 600 KW. DPR has already been	<p>The compliance of minimum environmental flow is applicable to all existing, under-construction and future projects. The existing projects, which currently do not meet the norms of these environmental flows, shall comply and ensure that the desired environmental flow norms are complied before 15th December 2019. The mini and micro projects which do not alter the flow characteristics of the river or stream significantly are exempted from these environmental flows.</p> <p style="text-align: center;">Replied by GoU</p>			

131

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD & GR (Ministry of Jal Shakti)
		<p>participation particularly the women of the eco- sensitive zone). There has to be a realistic scientific assessment as to how much would be the ecological loss in the environmentally sensitive eco-sensitive zone. This is the only stretch left in Ganga (in Himalaya), where one can still see the river flowing in its natural course.</p>	<p>release, the flow conditions are considerably improved.</p> <p>D/o WR, RD & GR: MoWR, RD & GR issued an order vide Gazette notification no. S.O. 5195(E) dated 09.10.2018 for releasing E-flow, where in the flow prescribed is more than the flow prescribed by NGT and Expert Body-II (Constituted by MoEF&CC in compliance of Hon'ble Supreme Court in the matter Civil Appeal no. 6736/ 2013).</p>	
3	<p>Dr. S. Sathya Kumar, Wildlife Expert, Wildlife Institute of India</p>	<ul style="list-style-type: none"> Regarding hydropower development in the Bhagirathi ESZ, the recommendations made by WII in its CEIA Reports (2012) need to be considered and required environmental flows has to be ensured. 	<p>As per the Hon'ble NGT order for e-flow on 9.08.2017, State government has issued an order for releasing minimum 15% of average lean season flow for dam/weir and barrage of the projects. Accordingly this has been made mandatory for all the projects.</p> <p>MoWR, RD & GR issued an order vide Gazette notification no. S.O. 5195(E) dated 09.10.2018 for releasing e-flow where in the flow prescribed is more than the flow prescribed by NGT and Expert Body-II (Constituted by MoEF&CC in compliance of Hon'ble Supreme Court in the matter Civil Appeal no. 6736/ 2013).</p> <p>This order has been contested by the State Government and an official request has been made to the Gol.</p>	<p>Minimum e-flows is to be maintained in Upper Ganga River Basin as per MoWR, RD & GR issued an order vide Gazette notification no. S.O. 5195(E) dated 09.10.2018 and subsequent amendment dated 14.09.2019.</p>

32

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
			<p>D/o WR, RD & GR: Minimum e-flows to be maintained in Upper Ganga River Basin Stretch starting from originating glaciers up to Haridwar has been notified by the Central Government vide Gazette notification (S.O. 5195(E) dated 09.10.2018).</p>	
4	Dr. Vinod Tare, Professor Department of Civil Engineering IIT, Kanpur	<ul style="list-style-type: none"> • Boundary conditions (longitudinal, lateral and vertical connectivity of rivers/streams, proper tunneling techniques, disposal of debris) for development of hydropower projects should be clearly stated upfront in this chapter. 	<p>Hydro-projects upto 2MW capacities are in permitted category.</p> <p>Boundary conditions of the projects in the BESZ will be incorporated in the detailed engineering stage.</p>	Replied by GoU
5	Prof. Brij Gopal	<ul style="list-style-type: none"> • The impacts on the flow and character of the river Bhagirathi and its tributaries in the ESZ should have been analyzed, and future scenarios should have been developed to bring out the specific developmental needs within the ESZ, within the carrying capacity of the area. The impacts of climate change should have been then taken into consideration in the development plans. • In the absence of such an analysis, there is no justification for most of the proposed activities. Further, the 	<p>UJVNL on direction of GoU have done extensive CEIA studies in which experts from IIT-Roorkee NIH, Department of Forestry and Natural Resources & Department of Environmental Sciences, HNB Garhwal University were the members.</p> <p>It has been mentioned in the study that there is no adverse impact on the environment from the projects upto 2 MW capacity.</p>	Projects >2 MW have already been excluded from the revised ZMP.

133

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>DRAFT ZMP does not state anywhere how the proposed activities will mitigate/ ameliorate the present problems or will cause any other environmental problem or have any impact on the river. Still further, the impacts of the proposed development activities on the two National Parks should have also been examined.</p> <ul style="list-style-type: none"> • The BESZ notification required that Carrying Capacity study shall be carried out based on the existing infrastructure and shall not be based on future projections of any project that requires environmental or forest clearance. • Only 'Conclusions and Recommendations' of the Carrying Capacity studies in respect of Hydropower projects are available in the DRAFT (Annexure 54). The study does not bring out in any manner the impacts of the proposed 10 HEPs on the ecology of the river system within the ESZ, except recommending studies on E-Flows. Where these 10 HEPs will be located and what will be their cumulative impact after considering the existing and under construction HEPs are not examined. The study on carrying 		

134

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		<p>capacity applies the average water footprint for India also to be BESZ area that is highly questionable. Further, the study of only 39.4% of the 3.5 cumec water is available for 'other purposes' after meeting the domestic and irrigation water requirements and this will declines to only 20.5% by the year 2051.</p> <ul style="list-style-type: none"> The recent E-Flow notification of the MOWR, RD&GR mandates the lean season E-Flow release at 20% and this makes the sustainability of any HEP-howsoever small-impossible. 	<p>Project viability is assessed as per the established guidelines of UERC and only viable projects are taken up.</p>	<p>Replied by GoU</p>
6	<p>Dr. D.P. Dobhal Galcilogist, Wadia Institute Of Himalayan Geology</p>	<ul style="list-style-type: none"> Electricity is the basic need of both domestic/residents and economic development of the area. The area is to be considered potential for cheap hydropower generation as a huge perennial water resource is preserved in the form of snow ice and glacier. But considering the terrain condition and fragile ecosystem only SHPs (<2MW) is proposed in the plan (As per the notification pertaining to BESZ). As mentioned in the plan that 24*7 continuous power supply will be provided in the BESZ area. But what is the ratio between total current power generation and actual consumption for the BESZ has not 	<p>For providing 24x7 power supply in the BESZ area, the following measures are being undertaken for generating power from renewable sources of energy:</p> <ol style="list-style-type: none"> 1. Rooftop solar power plants to the resident of BESZ area. 2. Upgradation of existing MHP's for mechanical and electrical uses. 3. 2X1 MW Suwarigad SHP has been proposed (UJVNL). 4. 10 MHP of 100 KW capacity each has been proposed (UREDA). 5. Grid connected solar power plants are being installed through private developers. 6. Power generation from Pirul (Pine Leaves) has been proposed. 	<p>Replied by GoU</p>

135

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		<p>been addressed in the chapter. What are the alternate resources of Power Generation to fulfill the Requirement is not discussed appropriately. <u>However emphasis is also given for solar, watermill energy and that can be promoted to increase energy resource in the area</u></p>		
8	Sh. Chandi Prasad Bhatt, Environmentalist	<p>• I have maintained from beginning that the Notification issued by the Government of India in December 2012 has given clear directions and guidelines for the preparation of a Master Plan for the Bhagirathi Eco-Sensitive Zone. Therefore the discussions on the Master Plan should be on the basis of these directions and guidelines. Mainly, on energy-related projects I believe that micro (hydel) projects should be constructed under the leadership of gram sabhas. Their ownership should rest with the gram sabha or village society. Big projects in this area are simply invitations to hazards and disasters. Therefore, I am not agreement with the construction of proposed projects bearing serial number 1 to 10 in the list below:</p> <p>(i) Assiganga-I (4500KW) – UJVNL</p> <p>(ii) Assiganga-II (4500KW) –</p>	<p>Considering the spirit of the provisions contained in the BESZ notification dated 18.12.2012 and honouring the views expressed by some of the members of NGT, committee, Energy department has not included any SHP of more than 2 MW in the ZMP of BESZ.</p>	Replied by GoU

136

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		<p>UJVNL (iii) Kaldigad (9000KW) -UJVNL (iv) Limchagad (3500KW) - UJVNL (v) Swarigad (2000KW) -UJVNL (vi) Songad (7 MW) -UJVNL (vii) Pilngad-II (4 MW) - Harsil Hydro Ltd. (viii) Siyangad (11.50M W)) - Harsil Hydro Ltd. (ix) Kakoragad (12.50, MW)) - Harsil Hydro Ltd. (x) Jalandharigad (24 MW)) - Harsil Hydro Ltd.</p> <ul style="list-style-type: none"> (it is) Necessary to include these micro hydro-electric projects and alternative energy projects in the Bhagirathi Eco-sensitive Zone (Master Plan) <p>1. Micro hydro-electric projects a) in this area the following projects already exist-</p> <table border="1" data-bbox="734 1042 1218 1283"> <thead> <tr> <th>S. N.</th> <th>Name of the Project</th> <th>Capacity (KW)</th> <th>Estimated cost for Renovation/capacity increase (in lakh Rs)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Kedarganga (Gangotri)</td> <td>20</td> <td>30.00</td> </tr> <tr> <td>2</td> <td>Rudragaira (Gangotri)</td> <td>150</td> <td>50.00</td> </tr> <tr> <td>3</td> <td>Harshil</td> <td>200</td> <td>400.00</td> </tr> </tbody> </table> <p>For the efficient operation of these projects it is important to undertake</p>	S. N.	Name of the Project	Capacity (KW)	Estimated cost for Renovation/capacity increase (in lakh Rs)	1.	Kedarganga (Gangotri)	20	30.00	2	Rudragaira (Gangotri)	150	50.00	3	Harshil	200	400.00	<p>a) Observation of Hon'ble member has already been included in the master plan. The DPR for the upgradation of Harsil HEP from 200 KW to 600 KW has been prepared.</p>	<p>Replied by GoU</p>
S. N.	Name of the Project	Capacity (KW)	Estimated cost for Renovation/capacity increase (in lakh Rs)																	
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2	Rudragaira (Gangotri)	150	50.00																	
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137

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		<p>needed renovation from time-to-time and capacity enhancement (up to 2 MW) without making basic changes in the existing structure.</p> <p>b) It is necessary to undertake feasibility surveys at the following locations in the BESZ for micro hydro electric projects and their construction with the help of local gram panchayats.</p> <table border="1" data-bbox="741 639 1245 1070"> <thead> <tr> <th>S.N.</th> <th>Name of the Project</th> <th>Capacity (KW)</th> </tr> </thead> <tbody> <tr><td>1.</td><td>Bhairongad</td><td>100</td></tr> <tr><td>2.</td><td>Basungagad</td><td>100</td></tr> <tr><td>3.</td><td>soragad</td><td>100</td></tr> <tr><td>4.</td><td>bangorigadh</td><td>100</td></tr> <tr><td>5.</td><td>Indravatigad</td><td>100</td></tr> <tr><td>6.</td><td>Swangad</td><td>100</td></tr> <tr><td>7</td><td>Varunigad</td><td>100</td></tr> <tr><td>8.</td><td>Hulgugad</td><td>100</td></tr> <tr><td>9.</td><td>Jalandhariga d</td><td>100</td></tr> <tr><td>10.</td><td>Khairgad</td><td>100</td></tr> </tbody> </table> <p>c) A survey should be done of the possibilities for power generation by strengthening/upgrading of existing traditional water mills with the addition of new turbines/runners at suitable locations in the eco-sensitive zone.</p>	S.N.	Name of the Project	Capacity (KW)	1.	Bhairongad	100	2.	Basungagad	100	3.	soragad	100	4.	bangorigadh	100	5.	Indravatigad	100	6.	Swangad	100	7	Varunigad	100	8.	Hulgugad	100	9.	Jalandhariga d	100	10.	Khairgad	100	<p>b) Survey and feasibility report along with DPR of 10 Projects in the BESZ area has been finalized. These DPRs have been prepared with the involvement of local people according to the need assessment, survey etc.</p> <p>All these 10 projects will be installed by the concerned Gram Panchayats with the involvement of local entrepreneurs. The revenue earned from these projects will be utilize by the concerned GPs for their development.</p> <p>c) Upgradation of 6 traditional water mills in BESZ area have been proposed.</p>	<p>Replied by GoU</p> <p>Replied by GoU</p>
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1.	Bhairongad	100																																			
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10.	Khairgad	100																																			

138

Chapter 8 : PUBLIC HEALTH AND SANITATION

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR,RD&GR (Ministry of Jal Shakti)
1	Dr. Hemant Dhyani	<p>Public health and Sanitation: Solid waste management is a major problem which entire valley is facing. Need a Zero waste plan for ESZ. Sewage treatment, Swajal, and environmental plans are much needed to be discussed with local concerns.</p>	<p>In the draft ZMP of BESZ, clause no.-3 (b) (xiv) point no. 3, 4 & 5 as per letter no. 584/XI/17/56(73)2016 (Govt. of Uttarakhand), the various Solid waste management (SWM) works have been described. As per Clause no.-3(b) (xiv) point no. 3 & 5 of ESZ notification, for segregation at source level color coated (Green & blue) biodegradable and non-biodegradable garbage bins are being proposed and used at House hold level. The Segregation shelters/Community Dustbins are being proposed at community level under Swachh Bharat Mission (Gramin) / Namami Gange Program. The above programmes are prepared, executed and operated by village water and sanitation committee constituted at village in a participatory manner.</p> <p>A Zero Waste Plan in entire valley of BESZ is already being executed. Details are as under-</p> <ol style="list-style-type: none"> 1. Community dustbins have been installed at each market places, to avoid littering of solid dry waste. 2. The community dustbins are weekly unloaded and collected at waste segregation point. 3. At segregation point the waste is segregated and finally compacted through a compactor machine to minimize volume, optimum for Transportation. 4. We have collected and transported around twelve lakh liquor bottles this year to recycling plant in Haridwar. 5. Massive cleanliness drives have been 	Replied by GoU

139

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
			undertaken by district administration and in furtherance of such campaign; the district administration has collected more than twenty truck garbage from Gangotri and high Himalaya regions. 6. Sewage Treatment plants are working at Gangotri city and Uttarkashi city in Bhagirathi eco sensitive zone, within parameters notified by central pollution control board.	
2.	Dr. Brij Gopal Founder Coordinator, President National Institute of Ecology	Activities like setting up of drinking water bottling plants of 10 to 20 thousand LPD capacity in the ESZ with an eye on export revenue is most undesirable given the fragile nature of the ecosystem.	There are no proposed activities of setting up of drinking water bottling plants in the ZMP as it is a prohibited activity in ESZ notification.	Replied by GoU

140

Chapter 9 : TOURISM

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1	Dr. Ravi Chopra Director People's Science Institute	<p>• Another term that has been grossly misunderstood in ZMP is carrying capacity, Reference has been made to carrying capacity-based planning and a carrying capacity analysis (study) carried out by JPS Associates. The analysis is simply limited to road transport facilities and accommodations required. Carrying capacity in terms of the critical geographical and topographical limitations, the Overall fragility of the area due to its unique terrain & ecology and environmental impacts, has not been considered.</p> <p>The carrying capacity should consider the following criteria along with a threshold limit</p> <ul style="list-style-type: none"> - Environmental impact of sewage and waste disposal, air pollution, noise pollution etc. - Water pollution in water bodies and the Ganga river. - Impact on Himalayan flora & fauna, particularly in the core Zone of the Gangotri National Park - Geological vulnerability of the area (landslides & land-sinking prone zones) and seismic sensitivity 	<p>A study was conducted for Sustainable development of the tourism sector keeping in view of symbiotic relationship between tourism activities and the environment (from natural, economic and social point of view and is not limited to road, transport and accommodation alone). The analysis has been done based on ecology-tourism matrix model which focuses on resource conservation and sustainability required in developing a sustainable tourism plan. Maximum suggested parameters have been considered while evaluation of carrying capacity of the area.</p> <p>The carrying capacity assessment was based on 03 components:</p> <ul style="list-style-type: none"> A. Physio-Ecological, B. Socio-Demographic, and C. Politico-Economic. <p>These components comprised a number of parameters including environment as mentioned below.</p> <p>A. The Physio-Ecological Indicators included Tourism Infrastructure, Power Availability, Water Availability, Transport, cultural heritage, Biodiversity (percentage of</p>	Replied by GoU

141

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		- Overall existing infrastructure	<p>protected areas, rare, endangered threatened (RET) species, Critical Habitats/ Ecosystems), Waste Management (Generation of waste, Movement of Hazardous waste, STPs, Waste Management Practices, Land Availability for Additional Infrastructure development and Communication.</p> <p>B. The Socio-demographic indicators included tourist demography, health and hygiene (availability of public toilets, availability of PHCs. local practices of Public Hygiene), Safety (Police Station, Fire service, Mechanisms of Disaster Management).</p> <p>C. Politico- Economic Indicators included Employment and Tourism Development Programmes and Projects running in the state.</p> <p>-The carrying capacity of tourist in Gangotri National Park is already restricted to 150 tourists/day. Entry of tourists is prohibited in the core zone.</p> <p>-Overall Infrastructure has also been taken into account by survey on parameters including Quality of roads, Quality of way side amenities, public conveniences, Sewerage and Drainage system, Garbage Disposal, condition of city roads, drinking</p>	

142

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		<p>It may be better to assess the carrying capacity in a few specific stretches such as:</p> <ul style="list-style-type: none"> - Uttarkashi to Harsil - Harsil to Gangotri - Gangotri to Gaumukh - The Nelong Valley - Dayara bugyal 	<p>water supply, condition of street lighting, condition of signage, availability and adequacy of - mass transit system, other Commercial Transportation systems, AC Tourist Coaches, Authorised Tour Operators, Luxury Hotels, Budget Hotels, Tourist Guidance/ Reception Centres, Trained Tourists Guides, Condition Of Public Hygiene, Public Utilities at Tourist Attraction Sites and Condition of Signage within The sites, Parking Facilities, Conservation of Heritage Sites, Illumination of Monuments, Power Supply Situation and Condition of Telephone/Mobile Services.</p> <p>- The assessment has been done for locations including Harshil, Dayara Bugyal, Gaumukh, Bhijwasa, Uttarkashi, and Gangotri and site-specific recommendations have been given based on Ecology-Tourism Matrix (ETM) model.</p> <p>-Nelong Valley is under Inner Line Permit area and in present scenario; only 36 persons are allowed to visit the area.</p>	
2	Prof. Brij Gopal	<ul style="list-style-type: none"> • The study on the carrying Capacity in the chapter on Tourism is limited to infrastructural requirements of roads and anticipated accommodations, without any reference to the impacts of such developments on the river 	<p>The carrying capacity assessment has been done based on parameters including environment as explained above. It included indicators covering Physical-Ecological, Socio-Economic and Political-Economic aspects.</p>	Replied by GoU

143

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		<p>ecosystem for which the ESZ was notified. The Notification already mentions of phenomenal increase in human populations and tremendous increase in anthropogenic pressures. It is beyond imagination how the increased projection by the study on carrying capacity will not deteriorate further the river and its ESZ, the study and its plans for future development of various facilities are in total violation of the ESZ notification</p>	<p>The Carrying Capacity has been used to define the capability of the area to endure the maximum level of development. In consideration of all the above mentioned parameters, the values of Carrying Capacity in the area has been calculated. The study was conducted on a large scale, based on available literature and methodology. Since the study was one of its kind in the country and without any standard reference for carrying capacity assessment on such a large scale covering 89 locations, the findings of the study can be used as a base line study for further detailed/ micro level assessment as mentioned in the suggestion.</p>	
		<ul style="list-style-type: none"> • The Draft ZMP has been prepared apparently by respective department keeping their own perspective and future plans in mind, and without attention to specific requirements and goals of the ESZ. The ESZ notification included very general broad framework within which certain developmental activities could be planned in view of the socio-cultural religious significance of the area that has high tourism pressure. Activities like setting up of drinking water bottling plants of 10 to 20 thousand LPD capacity in the ESZ with an 	<p>No such activities like setting up of drinking water bottling plants is going on in BESZ with permission of the department, and neither such activity has been proposed in the zonal master plan.</p>	<p>Replied by GoU</p>

144

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		eye on export revenue is most undesirable given the fragile nature of the ecosystem.		
4	Dr. Hemant Dhyani	<ul style="list-style-type: none"> • Tourism: The vision and objectives of this chapter needs to be discussed and corrected accordingly further, the carrying capacity study cannot be considered as complete. It does not consider capacity of Existing infrastructure (buildings, hydro projects, roads, parking areas etc) and waste disposal sewage, air pollution, noise pollutions, Water pollution in the numerous streams & the Ganga river. Post disaster scenario - cloudbursts & floods due to climate change Ecological vulnerability of the area (Seismic sensitivity, land-sliding & land-sinking prone zone) and Impact on wild life, Himalayan flora & fauna in ESZ should be the part of carrying capacity study. 	The study for carrying capacity was conducted based on existing literature and available models. The study could be utilized as a base for further detailing and is in convergence with the concerned departments in futuristic studies in the said domain.	<p>In respect of hydro projects, it is to mention that projects >2 MW have already been excluded from the revised ZMP.</p> <p>In respect of waste disposal, sewage, water pollution in the numerous streams & the Ganga river, various activities being taken have been replied by GoU under the Chapter 8 : Public Health & Sanitation.</p>

145

Chapter 10 : ROAD INFRASTRUCTURE AND DEVELOPMENT

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1	Dr Ravi Chopra Director People's Science Institute	<p>The basic concerns involved in constructing or widening highways (state and national) and village roads in the BESZ are</p> <p>(i) Ensuring the stability of slopes in this geologically fragile area;</p> <p>(ii) Ensuring the "Nirmal" flow of the Bhagirathi and its tributaries i.e. ecologically safe disposal of debris. The guiding principle is to minimize threats to ecological and livelihood security in the BESZ.</p>	<p>The alignment is being chosen in such a way to avoid unstable slope. Modern technique of slope stabilization shall be adopted to mitigate the effect of construction. Such type of provisions has been made on Page 205 & 210 of Part I of ZMP.</p> <p>Muck generated during construction of road shall be dumped in safe identified dumping zone. Free flow of natural <i>nalas</i> shall be ensured by constructing road side drains, scuppers and bridges. Such type of provisions has been incorporated on Page 210, 211 of Part I of ZMP.</p>	Replied by GoU
2	Navin Juyal dt 21/10/2018	<p>Roads are the major hit during flash floods (extreme hydrological events). It was observed that during the June 2013 majority of the roads that were washed away were constructed on the fluvial terraces (river born sediment proximal to the river channels. Considering that the flash floods are common in the Himalayan Rivers and it is likely that (based on recent trends), their magnitude and frequencies are going to increase with time. Therefore, it is advisable</p>	<p>The alignment of the roads is being chosen as per the guidelines of the IRC and shall be finalized after detailed geological investigation. Such provisions have been incorporated on Page 210, 211 of Part I of ZMP.</p> <p>The suggestions of the geologist shall be incorporated in the DPR of the particular project. Wherever the alignment of road passes along the river, it shall be ensured to keep the alignment above the High Flood Level. HFL shall be ensured with the help of local enquiry by</p>	Replied by GoU

146

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		<p>that future roads should be aligned in a manner that they are above the flood inundation levels (which of course is difficult to ascertain because there is a lack of data pertaining to historical and geological floods in Bhagirathi River). Nevertheless, a safe elevation with hard rock basement can always be selected against the river born material, colluvium or old landslide deposits that are susceptible to toe erosion- a factor responsible for majority of the road destruction in the Himalayan region.</p> <p>ZMP document says that they will inflict minimum damage to the vegetation natural springs and first order streams. I find no mention of how springs, forest cover, and first order streams are going to be affected/encountered during the construction or improvement of the existing roads.</p> <p>What would be the alignment of the roads from the river beds, streams etc.? Merely stating that all latest scientific measures would be implemented does not suffice. Because toe erosion during</p>	<p>consulting the local peoples & with the impressions of previous flood.</p> <p>Due diligence has been given while proposing NH widening work. Further studies can be done during the preparation of detailed site specific micro plans and all such issues like buffer zone can be addressed in there.</p> <p>Before starting the project detailed geological investigations shall be carried out and the suggestions should be incorporated in DPR's of that particular project. Wherever the alignment of road passes along the river, it shall be ensured</p>	

147

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		<p>turbid flash flood is one of the major reasons for the destruction of the roads in Himalaya. Unfortunately, the ZMP document does not provide any data on the historical flash floods from the eco-sensitive zone. Considering that the river was frequently experienced flash floods (1978, 1995, 2010 and 2013), the flash flood data is a crucial for safety of the infrastructures including the roads in the eco-sensitive zone.</p>	<p>to keep the alignment above the High Flood Level. HFL shall be determined with the help of local enquiry by consulting the locals, & with the impressions of previous flood marks. Toe erosion will be avoided by construction of attracting/deflecting spurs and other river training methods as per IRC 89 like gabion toe walls, concrete blocks etc.</p>	

148

Chapter 11 : DISASTER MANAGEMENT

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
1	Dr. Navin Juyal, Geologist/ Scientist-SF	In the ZMP, there is reference towards the GLOF, which seems to be a likely possibility, considering that the Gangotri is the largest glacier in Uttarakhand, and there must be number of supra-glacier lakes. This glacier is studied by many scientific organizations, hence by this time we must be having some data on the nature and extent of the glacial and supra glacial lakes in the Gangotri glacier complex. This important aspect is missing in the ZMP.	<ul style="list-style-type: none"> • The threat of GLOF arises mainly from moraine dammed lakes and not generally from supraglacial lakes that tend to appear and disappear with the passage of time. Details of the GLOF has been incorporated in page no. 222 of ZMP. • It is brought forth that the Department of Science and Technology, Government of India has set up a Centre of Glaciology at Wadia Institute of Himalayan Geology (WIHG), Dehradun that is mandated to carry out various glaciological studies, including monitoring of the glacial lakes. • WIHG together with GSI and other institutions have been, in the past, involved in studies related to damming of Bhagirathi in Gangotri area. • WIHG has been further requested to carry out regular monitoring of Gangotri glacier together 	Replied by GoU

149

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
			<p>with glacial lakes therein, and bring to the notice of the state government any threat emanating from these together with suggestions for mitigative action.</p> <ul style="list-style-type: none"> In the end it is submitted that the area is routinely monitored by the Forest department and abnormal changes, if taking place, are brought to the notice of concerned national agencies so as to ensure expert consultation and feedback for timely mitigative action. 	
2.	<p>Dr. D.P. Dobhal, Glaciologist, Wadia Institute of Himalayan Geology</p>	<p>Disaster is well known processes in the area such as landslide, cloud burst, river flood, debris flow, avalanche and Glacial lake outburst. It is to be noted that due to the climate change the extreme weather events increases and result of that frequency of different type of disaster increases in the area. Therefore, this sector of the ZMP becomes important in term of development and management for the planner & decision maker. The objectives mentioned in the chapter are good but clarity of the concept and</p>	<ul style="list-style-type: none"> It is put forth that District Disaster Management Plan is in place and the same is updated every year to identify emerging risks and take planned actions for their mitigation. Potential landslide zones have already been identified and measures are taken for prompt road clearance at these locations, particularly during the monsoon period. It may further be noted that 	<p>Replied by GoU</p>

150

S. No.	Name of the Expert	Comments of Experts (on Water related matters)	Response of Govt. of Uttarakhand (GoU)	Remarks of DoWR, RD&GR (Ministry of Jal Shakti)
		implementation part is somehow lacking.	<p>rainfall is a common triggering factor for landslides and therefore the state government is strengthening metrological instrumentation in the region and so far, 07 have been installed in the region. These are providing near real time information on various meteorological parameters both to IMD and State Emergency Operation Centre (SEOC).</p> <ul style="list-style-type: none"> • This data is being utilized for better forecast of metrological events and is also being provided to the masses online. • The district administration through USDMA (Uttarakhand State Disaster Management Authority) is also collaborating with UNDP for developing a rainfall threshold - based landslide warning system for Uttarkashi - Gangotri area. Three ARGs have been installed under this at Gangotri, Harshil and Sukhi and the model developed is presently being validated. 	