



## Bhagirathi Eco-Sensitive Zone

Comments/ Suggestions on the Zonal Master Plan and  
recommendations by the Expert & Non-governmental  
Members of the Monitoring Committee

# Index

1. A brief about the eco-sensitive zone notification.....	Pg 3
2. The past disasters and current ecological challenges in the ESZ.....	Pg 4
3. A brief cultural & ecological sketch of the area.....	Pg 11
4. Vision & scope for the zonal master plan of the ESZ.....	Pg 17
5. Comments on plans submitted by different departments	
a. Forest.....	Pg 18
b. Tourism.....	Pg 19
c. Roads.....	Pg 22
i. NHAI	
ii. PWD	
iii. PMGSY	
d. Swajal .....	Pg 29
e. Irrigation.....	Pg 30
f. Agriculture.....	Pg 32
g. UJVNL.....	Pg 35
h. Rural Development.....	Pg 36
i. Electricity Distribution.....	Pg 39
6. Conclusion.....	Pg 41

## **I. A Brief About Eco-Sensitive Zone Declaration**

Since 2006, a huge public outcry against three bumper to bumper hydro power projects on the upper stretch of the Bhagirathi - Ganga was raised. After much deliberation, in 2010, a GoM comprising of Sh.Pranab Mukherjee, Sh.Jairam Ramesh & Sh.Sushil Kumar Shinde, arrived at the decision of cancelling these 3 projects (Loharinag Pala, Pala Maneri & Bhairon Ghati) to ensure protection of this area. In his letter dated 23.08.2010 to Dr. Agarwal, who fasted for this cause, the then Hon'ble Finance Minister – Sh.Pranab Mukherjee, announced that apart from cancellation of the three hydropower projects, the government of India has also decided to "declare the approximately 135 km stretch from Gaumukh to Uttarkashi as an eco sensitive zone under the environmental protection act 1986." Elaborating on the reasons, he stated that *"we have come to this decision keeping in mind the very special features and unique status of the sacred Ganga in our culture and in our daily lives. The holy Ganga is the very foundation and is at the very core of our civilization"*.

In the 2<sup>nd</sup> meeting of the NGRBA (National Ganga River Basin Authority) held on 01.11.2010, the decision was finally approved. Thus with due consideration of the cultural significance of the origin path of the Ganga, the decision to preserve this last pristine stretch of the river Ganga was consciously taken subsequent to the cancellation of the hydropower projects that alter the flow of the river. Thus the Bhagirathi eco-sensitive zone notification is a notification meant for protecting the spiritual-cultural significance of the area and to protect/ conserve the fragile ecology of the origin of the national river – Ganga. This is the core spirit of the eco-sensitive zone declaration and should be the base consideration while formulating the zonal master plan.

- In order to delineate the boundaries of the eco-sensitive zone, a research project was assigned to the Indian Institute of Remote sensing (IIRS), Dehradun. Based on the recommendations by IIRS, a watershed of 4179.59 sq meters was decided upon as an eco-sensitive zone. After deliberations by the expert committee on eco-sensitive zone within the MoEF, finalization of the boundaries of the ESZ and the activities to be prohibited, regulated & promoted was done. A representation from the state of Uttarakhand also participated in these meetings.
- The final notification dated 18.12.2012 was published in the Gazette of India. The state government was given the mandate to implement the notification based on a zonal master plan that was to be formulated as per the guidelines of the notification.
- The notification has been objected by the Uttarakhand political leaders on the ground of this being "anti-developmental". However, the stretch identified as eco-sensitive zone is of such fragile nature that it is not suited for the usual developmental activities being carried out elsewhere in the state. Moreover the state has witnessed many disasters in the past that have claimed thousands of lives and have left the area vulnerable.

## **(II) The past disasters & the current ecological challenges**

- Over the last few years, the frequency & intensity of disasters in the state of Uttarakhand has consistently been increasing. The deforestation has rendered the soil loose leading to increased cases of landslides. The flash floods due to cloud burst events were much infrequent. Experts have repeatedly pointed out that an increased burden of anthropogenic activities lies at the root of this frequent

destruction. It is required to study changes in the micro climate that might be triggering the cloud burst events.

- The area declared as the eco-sensitive zone has witnessed several ecological tragedies in the past. Landslides, flash floods, earthquakes, land subsidences in the past have claimed many lives & livelihoods. Some of the most recent disasters and their impacts have been explained below:
- There have been a variety of natural hazards, including occasional mass movements of destructive impact in the Uttarkashi and the adjoining regions in the past. The year 1978 witnessed widespread flooding and landslide activity due to cloud bursts and flash floods in the region. Landsliding in June 1980 had taken a toll of 24 human lives in Uttarkashi District. The disastrous landslide of 23 September 2000 in the area caused widespread damage. All these make it necessary to properly evaluate the potential hazards and suggest appropriate counter measures for future development of steep mountain sides and narrow valleys.

### **1991 Earthquake**

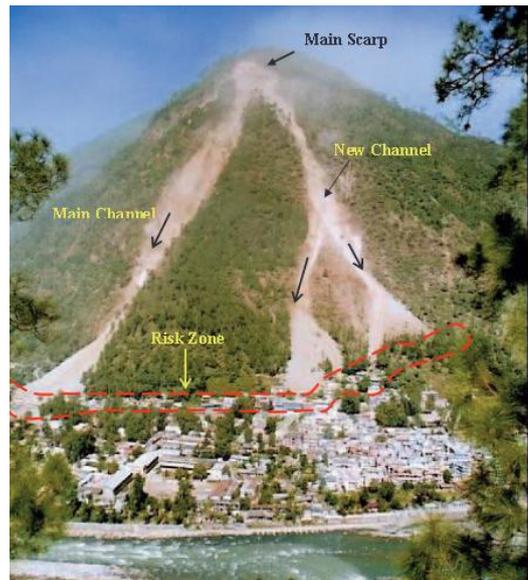
- On October 20, 1991, at 2.53 a.m. local time, an earthquake occurred in the Garhwal Himalayas in northern India. The earthquake caused strong ground shaking in the district of Uttarkashi, Tehri, and Chamoli in the state of Uttar Pradesh. Official information indicates that population of about 307,000 in 1,294 villages were effected; 768 persons died while 5,066 were injured. In addition the earthquake claimed 3,096 head of livestock. As any as 42,400 houses were

damaged [Garhwal Earthquake of Oct. 20, 1991 EERI Special Earthquake Report, EERI Newsletter, Vol.26, No.2, February 1992]

### **2003-The Varunavat landslide**

- The Varunavat landslide incident took place on 23<sup>rd</sup> September 2003. This landslide was a massive debris slide that blocked the national highway for more than a month. Many residential buildings, hotels & government offices that were located at the toe of the Varunavat mountain got buried in the debris from this landslide. The slope stabilisation after this massive landslide went on for years but even now the mountain is still not stabilized & the monsoons this year in 2015 have re-triggered the landslide.

- The Uttarkashi earthquake of 1991 induced slope instability and caused the development of many cracks in the hills of the region. The instability was further aggravated by anthropogenic activities at the toe of the hill slope resulting in disintegration of the rock mass and



increase in slope gradient and shear stress (Sarkar et al 2004). Another contributory cause was a forest fire on the uphill slope, which partly destroyed the vegetation preceding the event. All these factors potentially contribute to slope instability pre-conditioning of landslides. [Varunavat landslide disaster in Uttarkashi, Garhwal Himalaya, IndiaJOBNAME: 199 QJEG PAGE: 6 SESS: 3 OUTPUT: Tue Nov 2 15:42:16 2010 /hling/journals/geo/199/0902]

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## **2010 – Bhatwadi land sinking**

- In the month of August'2010, sudden land subsidence caused huge damage to the Bhatwadi tehsil of the the ESZ notified area. The land subsidence was noted subsequent to the blasting of the then under-construction HEP – Pala Maneri. This was derived at based on anecdotal evidences as the houses in the vicinity suffered cracks due to the uncontrolled blasting.



A close up view of cracked road



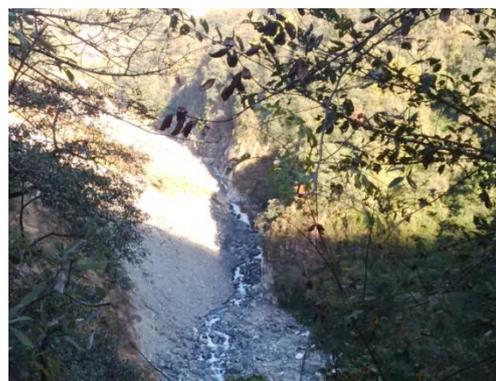
Dislodged shops and road

- The entire motor road was cut open with a deep crack almost 4-6 meters in depth and kept growing. The side towards the river sank a few meters along with shops and houses. On the upper side the cracks moved towards the hill side towards villages already bearing the cracks after the blastings for the under construction HEP.
- The road was the only motor link to Gangotri and hence this disaster had not only put an entire village in grave danger but also left countless people (locals and yatri) on both sides of Bhatwadi stranded. All access to Gangotri and the upper villages had to be closed.
- **The Bhatwadi area has been classified as a “Sinking zone” since then.**

## **2012 – Assi Ganga flash floods:**

- In the month of August 2012, an unexpected massive flash floods destructed the entire valley of the tributary Asi-Ganga in Uttarkashi. Following a cloud burst, this flash flood in Asi-Ganga valley resulted in large scale destruction of the roads & bridges which still has not been restored.
  - Abnormally high precipitation in the catchment of Asi Ganga, that has its confluence with Bhagirathi at Gangori, on 3rd and 4th August, 2012 induced flash floods that devastated the downstream areas up to Uttarkashi. Motor bridge at Gagori over Asi Ganga on Rishikesh - Gangotri National Highway was washed off in the incidence together with road stretches and bridges on various link roads. Entire area of Bhatwari tehsil ahead of Gangori was thus physically cut off from the outside world and tourists and pilgrims in large numbers were stranded at different places. [DMMC report – Assi Ganga flash floods]

- The geo-hydrological condition of the hill slopes in Asi-Ganga valley cause slope instability as several streams combine in different locations to form the



The debris in one of the streams in Asi-Ganga valley close to Sangamchatti

Asi-Ganga and reduce the shearing strength of the slope causing it to slide easily. Additionally, the local streams in the area flow with great

force through narrow channels making the area vulnerable to landsliding. It has been concluded that geomorphologically the entire Asi-Ganga valley depicts a highly unstable topography as is evident by the active erosion processes in the valley.

- 3 consecutive small HEPs [(Asi Ganga –I (4.5MW); Asi Ganga –II (4.5MW); Kaldigad(9MW)] were being constructed and as per anecdotal evidences provided by the residents of the valley, it was the excessive muck by the under-construction HEPs that was deposited in the main river bed, which led to temporary pondage and caused much havoc downstream. The almost completed HEPs got completely washed off and the path of the river is totally altered.
  - The fieldwork carried out in the area brings forth the fact that almost all the devastation has taken place in the proximity of the river bank and is caused primarily by abnormally high precipitation in the catchment of the streams. This is however no abnormal phenomenon and the river morphology in the area shows evidences of occurrence of similar events in the past. One can therefore deduce that the infrastructure and other facilities that got destroyed in the event were located at wrong place and due consideration was not given to the possibility of high floods in the adjoining rivers and streams.
  - It needs to be understood that it is not possible to erect embankments at all places and embankments only provide a temporary solution to such problems.

Moreover water would always find its path to flow past to lower grounds and erosion of banks is a natural process.... All these changes are responsible for enhanced flash flood risk in the area. It is therefore highly important to strictly regulate developmental initiatives in close vicinity of streams and rivers. [DMMC report – Assi Ganga flash floods]

### **2013 – Bhagirathi & Assi Ganga flash floods**

- An unprecedented flash flood caused by a torrential rain effect in the state of Uttarakhand on 16<sup>th</sup>, 17<sup>th</sup> & 18<sup>th</sup> of June 2013 claimed lives of thousands of people and destroyed livelihoods of many.
- The notified eco-sensitive zone also faced the tremendous flash flood fury of 2013 in river Bhagirathi & her tributaries. Massive loss of road infrastructure was seen alongwith huge quantities of debris deposition in the main river bed.
- Almost all of Gangotri National Highway had washed away and most of the area was only accessible through helicopters or on foot. Thousands of tourists and villagers were stranded without sufficient food supply.
- The increasing anthropogenic pressure in the state of Uttarakhand was reported to have led to such intensity of disasters by the degradation of the overall ecology.
- The restoration/ repair works in the district are much needed for the security of the residents and for the protection of the remaining infrastructure. Though efforts towards restoration works have been made but the standards of works being done so far are disappointing.

### **(III)The Cultural & Ecological sketch of the stretch of Gaumukh to Uttarkashi**

- Uttarkashi literally implies the town of Kashi located in North. Being the origin valley of the river Ganga, Uttarkashi is of immense cultural significance. This Kashi of North, like Varanasi is located at the confluence of the 2 rivers Varuna & Asi. Located on the banks of the Ganga, and beside Varuna parvat, Varanasi and Uttarkashi are very sacred and special places for the Hindu pilgrimage.
- Gangotri (Gaumukh ) is where the Ganga originates and is called as Bhagirathi. "Ganga" comes from the root word "gam gacha" – meaning that "which flows"; that "which moves". In "Skandpuran" (one of the most sacred and authentic scripture of Hindus) "Kedarkhandam" describes the history of the Origin of Ganga with the cultural /religious and spiritual significance of the places of Lord Shiva "Kedar" along with the geographical identification. The Uttarkashi valley has great significance and is mentioned as being revered by Lord Shiva himself.
- In the valley of origin of the Ganga there is a great cultural and religious significance of confluences ("Sangam", where different tributaries meet Bhagirathi). Along the path of the river Bhagirathi, there are many historically & culturally significant temples and places. It is in this valley that millions of Hindus come to witness the living flow of our age old culture and civilisation thereby making the area sacrosanct.
- Gangotri is one of the char dhams of the state of Uttarakhand & millions of pilgrims come to Gangotri every year for darshan, bath in the holy waters and prayers.

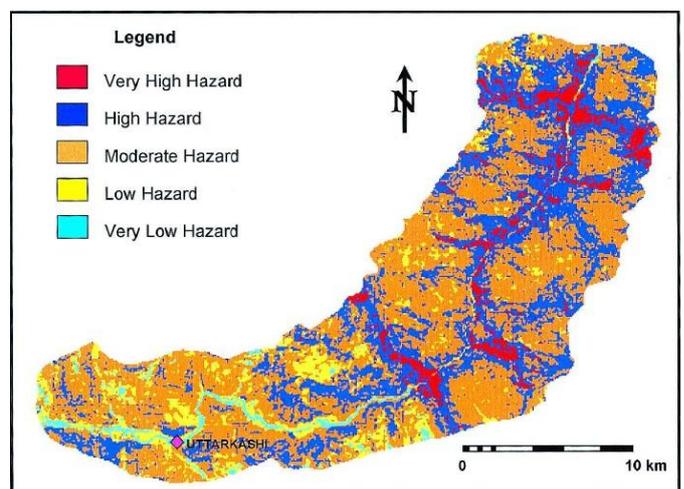
## **Ecological sketch of the area:**

- Located in the upper Himalayas, the notified area of the Bhagirathi eco-sensitive zone is an interwoven, interdependent fragile Ganga-Himalayan Basin. Geographically the area falls under the Garhwal lesser Himalayas and Higher Himalayas.

The MCT separates the Lesser Himalayan Formations from the overlying Higher Himalayan Munsiri group of rocks and Vaikrita Thrust separates the Munsiri Formation from the overlying Joshimath Formation. The thrust zones are highly crushed and show unstable slopes along the strike. Several minor irregularly oriented faults are also present. ).[ GIS-based Landslide Hazard Zonation in the Bhagirathi (Ganga) Valley, Himalayas - int. j. remote sensing, 2002, vol. 23, no. 2, 357–369]

## **High landslide prone zone**

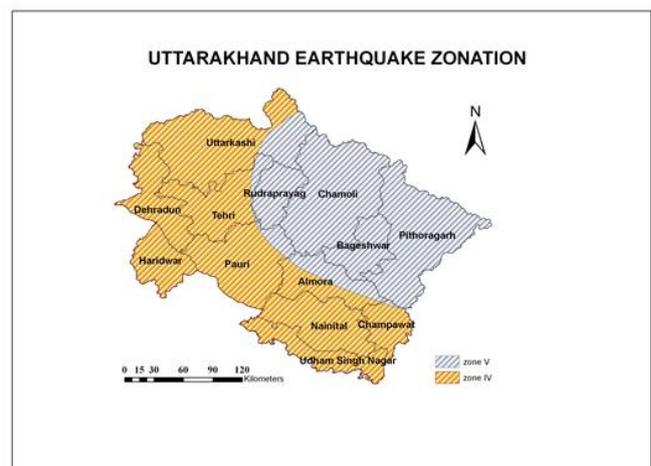
- A significant part of the eco-sensitive zone area lies in high to very high hazard landslide zone. After the recurrent disasters of 2012 and 2013, many old landslides have become active and many new landslides have also been seen.
- A Landslide hazard zonation map of this area classifies most of the area under "High" to "Very high hazard zones.
- Among the various natural hazards, landslides are the most widespread and damaging hazard. They cause loss of life and property, damage to



natural resources(e.g. vegetation, land and soil ) and hamper developmental projects like roads, bridges and communication lines, etc. It has been estimated that, on average, the damage caused by landslides in the Himalayan range costs more than US\$ 1 billion besides causing more than 200 deaths every year, which overall is considered as 30% of such types of losses occurring world-wide (Naithani 1999).[ GIS-based Landslide Hazard Zonation in the Bhagirathi (Ganga) Valley, Himalayas - int. j. remote sensing, 2002, vol. 23, no. 2, 357–369]

### **High Seismic sensitivity – Zone 4 & 5**

- The state of Uttarakhand is amongst the most seismically active states in the country. There are many parallel thrusts & faults in the state. The MCT falls right in the middle of the ESZ notified area. The largest earthquake in the state has been the 1991 Uttarkashi earthquake.



NDMA

### **Hydrogeology of the Area:**

- The water sources of the Himalayan terrain are of great significance. The upper reaches of the Himalayas are the recharge areas of the Tarai & Bhabhar water bodies in the plains. Lying at the confluence of the Himalayas & the Indo-Gangetic basin, the Tarai & Bhabhar regions are carry the fertile alluvial silt of the waters from the upper reaches that brings the rich fertility to this area and carry it further downstream.

- The major water bearing aquifers are quartzites and phyllites of Garwhal group. No pump tests are being carried out to know the aquifer parameters. However being a hilly terrain the aquifer is discontinuous as a result no resource evaluation is carried out, but in such areas microlevel hydrogeological investigation to delineate the local aquifer and its potential is highly recommended.
- In the absence of an adequate hydrogeological study, the anthropogenic activities disturbing the aquifers should not have been permitted as a loss of these aquifers cannot be mitigated. The connectivity of ground and surface water needs to be studied in detail. In the absence of such studies particularly microlevel studies the anthropogenic activities in the area has disturbed the hydrogeological settings which has resulted in loss of water resources at many places.
- Irreversible impacts on the perennial aquifer sources can be seen in the notified area around the existing hydro-power projects. Many sites for road cutting, also cut into an aquifer source thereby disturbing the overall balance tremendously.
- The notified eco-zone terrains are part of an integrated and interconnected system. Preserving these terrains insitu is very essential. Hydrogeological connectivity of the entire basin is very crucial and cannot be ignored. Hydrogeological network is also linked to flora and fauna thus it is the important and integral component of the entire ecological system of the area, thus cannot be ignored.
- The interwoven upper catchment of the Ganga-Himalayan basin is a watershed area endowed with tributaries and many spring water

sources. The tributaries of Bhagirathi in the eco-sensitive zone are the following:

- a. Kedar Ganga at Gangotri
- b. Jadh Ganga at Bhaironghati
- c. Kakora gad & Jalandharigad at Harsil
- d. Siyan Gad near Jhala
- e. Asi Ganga near Uttarkashi

The Bhagirathi sometimes called Jahnvi or Devnadi is the largest tributary river of the Ganges (Ganga) in northern India. It is perennial in nature as it receives all the three types of water inputs i.e., snowmelt runoff, rainfall runoff and groundwater (Mane et al.2005). However, the three components vary in space and time. The extent of human activities that influence the environment particularly the freshwater has increased dramatically during the past few decades (Kulshrestha and Sharma,2006;Khanna et al.,(2006). The scale of socio-economic activities, urbanizations, industrial operations and agricultural production has a widespread impact on water resources. As a result, very complex interrelationships between socioeconomic factors and natural hydrological and ecological conditions have developed.[ Pathak and Prasad (2014) *Biotechnology International* 7(3): 75-84]

- The river Bhagirathi has formed a deep constricted V-shaped valley and indicates a youthful geomorphological stage of the region. Generally, the tributary streams are at a higher elevation (about 40–100 m) than the main river (Bhagirathi). The Bhagirathi flows transverse to the structural axis of the Himalayas. It is fed mainly by small subsequent streams.

- Gangotri glacier is a large collection of glaciers. Glacier melting due to climate changes is a cause of much worry. Gangotri glaciers & the supporting glaciers are melting resulting in the formation of huge lakes. In the last 3-4 years it has been repeatedly reported



Fractured ice in the lower ablation (runoff) zone

that the Gaumukh has receded at an alarming rate, so much so that the 30.40km glacier has melted & reduced itself to a mere 24.5kms.

- With the increase in the retreat of the glaciers, more and more debris will accumulate. These para-glacial sediments can be brought down with the rains during monsoons or in the case of a glacial lake outflow, and pose a big threat downstream. It was these sediments that resulted in the 2013 flood fury in the state of Uttarakhand.



Lake in Gangotri glacier

#### **(IV) Vision & Scope for the zonal master plan of the ESZ**

Based on the background & the cultural/ environmental sketch as cited above, the vision & scope for the zonal master plan should primarily entail the following 6 objectives -

1. Preservation and increase in green cover – thus promoting growth of both flora and fauna and thereby bio-diversity.
2. Encouraging and permitting only those activities on a local level which would help in achieving objective 1 and at the same time benefiting the local population economically – thus to achieve development using a 'green' vision.
3. Prohibiting several environmentally incompatible anthropogenic activities like reservoir-tunnel-barrage based hydropower projects, excessive tourist inflow, huge cement constructions etc. and impose regulations on other activities like road cutting etc so as to prevent over-burdening on the vulnerable ecology of the area.
4. To maintain and preserve the ambience of a wild and pristine Himalayan forest.
5. To maintain and preserve the Ganga and adjoining tributaries in the form of wild mountain rivers and streams – pristine, uninterrupted, free flowing and free from pollution.
6. To maintain the Gangotri valley as a place of spiritual and cultural importance – as a place of pilgrimage, meditation and worship.

The model and parameters laid down for Gangotri Eco-zone should be done with no compromise if we are serious about protecting our environment and collective existence. A standard which will act as a precedent will thus be set as such eco-zones are set up across the Himalayas and other parts of the country. A foundation must be laid for serious environment protection and turn-around. To do otherwise is to invite disaster.

## **(V) Comments on the plans of various departments and recommendations.**

### **a. Forest**

- The Forest plan seems to be a general compilation of the features of the area and is devoid of the specific aspects of forest conservation.
- The forest plan submits the aspects of soil & water conservation but the methodology for approaching towards the same has not been expounded upon.
- The forest plan for the ESZ appends the list of Van-Panchayat" in the ESZ but the aspects of strengthening the van-panchayat & engaging the local people in this with regards to conservation of local ecology & employment generation was important but has not been referred to.
- The aspect of increasing the forest cover has not been addressed.
- The migration of wild animals has been observed in the area and much harassment by bears, monkeys, wild boars etc have been reported by the residents. Therefore, conservation of the forests for the requirements of these wild animals must be addressed but is missing in the document.
- On p. 33 the plantations statistics reveal a large number of miscellaneous tree species have been planted in the ESZ after 2010. It is not clear whether these include the prohibited species or not. The FD should list the species planted. It has the records.
- Pp35-59 of the Forest Areas document overlaps with similar sections in the Tourism Master Plan. There is a need to integrate these sections.
- The tree-felling in the forest areas needs to be a regulated activity in the ESZ as per the guidelines of the notification. No planning for regulating the tree felling has been included in the ZMP.

## **b. Tourism**

- 1- As mentioned in the notification of MoEF that the zonal master plan shall be based on carrying capacity study of the eco sensitive zone. The ZMP of tourism prepared by Uttarakhand tourism development board has mentioned about the carrying capacity study in page no. 10-15. There are following important aspects, which are missing in the given information.
  - i- The whole idea with basic components (to make sure that the local ecology should not be overburdened) of the carrying capacity on which this study is being carrying out, is missing. The detail information in context of carrying capacity of existing infrastructure of various tourist destination is missing, only accommodation requirement based on tourist inflow is mentioned in pages 13,14 and 15 !
  - ii- The only one carrying capacity analysis of Gangotri nagar panchayat explained in page 10-12 shows that 5900 persons per day is the effective carrying capacity for tourism. While mentioning this point it is also mentioned that during the month of may and June there were road jams and overcrowding in hotels/guest houses/ashrams. But in the carrying capacity analysis of gangotri, the infrastructural burden of the area due to different structures like hotels/shops/ashrams/parking is missing ! As the landslides were also reported near gangotri temple in past few years therefore specific site wise analysis would be necessary for different developmental works in this sensitive area, but there is no mentioning of the point that if any particular site of this area has capacity to hold any further structure, if yes, then how much or if any other particular place is already overburdened etc.

- iii- For every tourist destination between Gangotri to Uttarkashi there should be a site specific carrying capacity study which is missing ! this study would be needed as a reference document to plan the feasibility of any infrastructural development around the area, the idea and details regarding this is completely missing !!
  - iv- In the present ZMP carrying capacity analysis is only considered in the context of required accommodation during gangotri yatra, what should be the feasibility criteria according to carrying capacity analysis to develop the infrastructure and to maintain the smooth tourist inflow and outflow, is completely missing !!
- 2- In the past all people were used to do all these Himalayan holy yatras including char dham by foot only. It is also mentioned in the notification that ZMP shall encourage development of walking paths for tourism and pilgrimage. But the plan to develop the walking path for gangotri yatra and other pilgrimage/ tourist sites is completely missing !! To connect the Gangotri via walking pilgrimage path is also necessary in view of any disaster or landslides which often happens during the monsoon period of yatra when the main highway blocks or washes out. The idea to promote walking pilgrimage will not only decentralize the crowd of tourist inflow but the alternative walking path will also be helpful during any disaster. The walking green tourism would also boost the local economy through home stays etc. but the plan regarding this most important aspect is completely missing !!
- 3- Based on various parameter the site wise assessment is given from page no. 16-41 where the details regarding current infrastructure and

their quality, physical ecology, social demography and political economy is mentioned but there is no explanation of any plan for developing these sites in view of green tourism !!

- 4- There is mentioning of the information regarding potential tourism locations in ESZ and main natural trek trails in pages 41-44 but the plan to develop the green tourism for these locations is missing !!
- 5- There is mentioning of cultural and heritage tourist places in a very incomplete manner !! As from Gaumukh to Uttarkashi each and every place has its own historical importance associated with great history and traditions which need to be elaborated and promoted in detail by the tourist and cultural department, unfortunately this is completely missing. Local Yatras, deity culture and melas of different villages have their own specialty, many other historical cultural sites need to be highlighted and promoted for cultural eco tourism, but the plan and information regarding this is missing and limited only in few paras of page 46 of current ZMP !!
- 6- Guidelines given for site selection and development in pages from 48-58 are in a right way but still insufficient and need to be more elaborated and refined.
- 7- Under the umbrella of carrying capacity study and guidelines for site selection, the ZMP for the guidelines of hotels, TRHs etc should be discussed and framed accordingly but the guidelines mentioned in pages 58-63 are not in tune with above. Plan to promote the local culture and traditional Garhwali food and therefore to maintain the

sanctity of this cultural holy yatra is missing !! Plan to promote well being clinics, ayurveda centers in the hotels, TRHs is missing.

8- No reference to the correct usage of the existing infrastructure in the form of well being clinics etc has been made. Moreover, the rectifications to the existing structures is also missing.

9- From pages 63-66 Guidelines for developing wayside amenities are discussed which needs to be more refined and finally incorporated in the specific site selection wise plans which are completely missing in this present document of ZMP of tourism.

10- The different guidelines discussed regarding tourist information center, heritage and nature trails, heritage property conservation, developing eco tourism etc from section 13-18 are in a good way and still needs to be more refined but the most important thing is the idea and plan to execute these guidelines site specific wise for the development around 88 villages and towns is missing !!.

11- Development plan of home stays along the yatra route and different tourist location considering the above guidelines for providing /encouraging local green employment is incomplete.

12- Some sections of the document seem to be cut and paste jobs from a generat Tourism Development Plan. P. 108 of the present document mentions angling potential for mahaseer fans. The presence of this species in the upstream area, however is questionable. Also after the disaster of 2012, the snow-trouts have completely vanished from the Asi-Ganga river and restoration of the area is important for bringing the species back.

**c. Road construction:**

- i. NHAI
- ii. PWD
- iii. PMGSY

Regarding proposals for various types of mountain roads

Para 2 (19) of the Gazette of India Notification for the R. Bhagirathi watershed from Gaumukh to Uttarkashi (100 km stretch) Eco-Sensitive Zone enumerates the following guidelines for the construction and maintenance of any road including untarred in the ESZ of more than 5 km length (including the extension or widening of existing roads) in the Zonal Master Plan:

(i) Provision shall be made in the design of the road for treatment of hill slope instabilities resulting from road cutting cross drainage works and culverts using bio-engineering and other appropriate techniques and by including the cost of such measures in the cost estimate of the proposed road;

(ii) The debris shall not be dumped down the khud or slopes but shall be subsumed in the construction of roads and the provision shall also be made for disposal of unused debris in appropriate manner at suitable and identified locations so as not to affect the ecology of the area adversely and the debris shall be treated and landscaped using bioengineering and other appropriate techniques and the cost of such measures shall be included in the cost estimate of the proposed road;

(iii) All roads shall be provided with adequate number of road side drains and these drains shall be kept free from blockage for runoff disposals and this runoff from the road side drainage shall be connected with the natural drainage system in the area;

(iv) Alignment shall be selected so as to minimise loss of vegetal cover;

(v) Appropriate design standards shall be followed while designing the roads including mass balancing of cut and fill and avoidance of unnecessary cutting.

(vi) Notice shall be given about all fault Zones and land slide zones along the roads indicating the beginning and end of such areas.

In addition to the above, Para 2 (16) also states that no development will be permitted in areas having steep slopes or areas which fall in fault or hazard zones or areas falling on the spring lines and first order streams or slopes with a high degree of erosion. It defines "steep hill slope" as a hill slope with a gradient of 20 degrees or more.

The various proposals below have not been discussed by the Monitoring Committee. Several clarifications are required regarding the impact of blasting during road construction or widening on springs and slope stabilities and the precautions to be taken thereof.

### **I. ZMP Submitted by NHIDCL**

This document refers exclusively to proposals made for modifications to stretches of NH 34 (earlier NH 108) lying in the ESZ (see Fig on the following page), a highway that is identified as a development project related to national security. The proposal includes some commendable provisions.

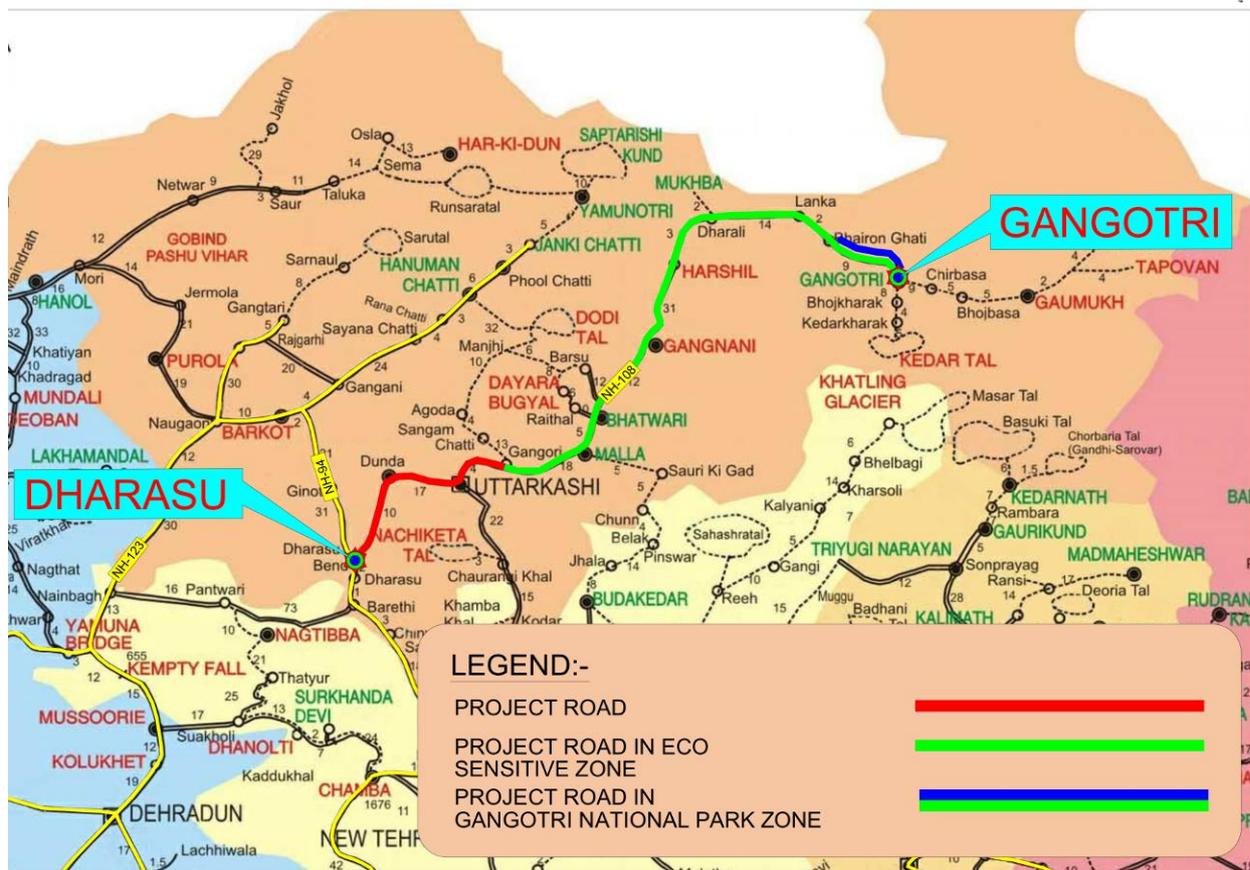


Fig.: NH 34 stretch in the Eco-Sensitive Zone

The document lists compliances with several details for each one of the guidelines for hill roads identified in Para 2 (19) of the Gazette Notification. Summary cost estimates are given at the end.

### **Plan Problems**

- (i) The document does not clarify which stretches lie on hill slopes that are > 20% gradient. These are presently not permitted under the ESZ Notification. See also Clause 2 (16.i) of the Gazette Notification.
- (ii) The document lists locations of 26 debris dumping zones. Several of them are located in Reserved Forest areas. Para 2 (12) of the Gazette Notification prohibits change of land use from green uses to non green uses in the Zonal Master Plan. Exception can be made to meet the

legitimate residential needs of the local residents due to the natural growth of the existing local population.

- (iii) At some locations increasing the road width will entail loss of vegetal cover. The document does not clarify whether alternative alignments have been considered or not, except to say that 'at constrained locations the formation width has been reduced to 10m against the proposed 12m.'
- (iv) A 9km stretch of the highway lies in the buffer zone of the Gangotri National Park. MoEF clearance for this is still awaited.
- (v) Two major realignments are proposed. The slope of the mountain and the current land use of these stretches are not identified. An on-site evaluation for assessing the realignments

## **II. ZMP submitted by Irrigation Department for PMGSY**

This plan includes (i) Four sanctioned PMGSY where work is in progress and (ii) Eight projects that have received administrative sanction at the district level but are awaiting clearance from MoEF, GoI.

No details have been given for the four sanctioned projects. It is therefore not possible to say whether the roads guidelines given above (on pg. 1) are being complied with or not. A field-based review is urgently required.

For most portions of the second set of eight roads the hill slopes are well in excess of the 20% limit in the Gazette notification. These are currently not

permitted. The Irrigation Department has sought relaxation of this guideline. The matter will have to be decided by MoEF, GoI.

Some of the proposed eight roads provide the proverbial last mile connectivity to individual villages. PMGSY stipulates such road construction to villages with a population of more than 250 persons. But no population data has been given in the proposal.

Several stretches of the proposed eight roads pass through forest areas. This is not permitted as per the present guidelines. The Irrigation department has sought clearances from MoEF, GoI.

The proposals do not discuss any impacts on springs, slopes and built structures. No details are given about the location of debris dumping sites or their present use.

Alignments of the eight roads have been determined after 'consultation with local people.' It cannot be assumed that these are the ones that will lead to minimum loss of vegetal cover as demanded by the present guidelines. Powerful local vested interests often sway official opinion. This issue needs to be cross-checked by the Forest Department or by the Monitoring Committee.

### **III. ZMP submitted by PWD, Bhatwari block**

- This plan includes proposals for (i) Seven sanctioned motor roads and (ii) Five projects that have yet to receive administrative sanction besides construction of four bridges and an M/R project.

- No details regarding the hill slopes, alignments, land use affected, or debris dumping locations have been given for the proposed projects. It is therefore not possible to say whether the roads guidelines given above will be complied with or not. A field-based review is urgently required.
- It appears that portions of proposed roads lie on hill slopes that are well in excess of the 20% limit in the Gazette notification. These are currently not permitted. The PWD, Bhatwari has suggested relaxation of this guideline. The matter will have to be decided by MoEF, GoI.
- Five of the proposed roads provide connectivity to villages that have less than 250 persons population. Since these are not PMGSY roads, it is not clear whether the PMGSY stipulation of connectivity for villages with a population of more than 250 persons applies in these cases.
- The proposals do not discuss any impacts on springs, slopes, vegetal cover and built structures. No details are given about the location of debris dumping sites or their present use.
- Many of the road alignments proposed by the PWD seem to be unnecessarily long and go via reserved forest areas. Eg: Road to village Heena.
- Also many roads are being opposed by the locals of the area. Eg: Daang-Pokhri. These aspects should have also been mentioned in the proposal but are missing.

**Concluding Recommendation:** It is suggested that there should be one format for all proposals pertaining to road construction projects. A few institutions like Govind Ballabh Pant Institute for Himalayan Environment & Development and the Central Road Research Institute have prepared guidelines for safe green roads. These need to be referred to.

**d. Swajal**

- The document submitted by Swajal is not a plan but seems like a vague compilation of rural water supply and sanitation projects in the Bhagirathi Eco-Sensitive Zone. There is no attempt to prepare a water supply and sanitation plan keeping in mind the objectives of the Eco-Sensitive Zone, i.e., to restore, conserve and use the natural resources of the ESZ in a sustainable manner with the first benefits flowing to the local population. Swajal's document shows no application of the mind and is a poor cut and paste job. It is unacceptable as presented.
- The first priority of the Swajal officials should be the protection of water sources, e.g., revival of dried up or drying springs and other water sources in the ESZ. Instead three lists of water supply and sanitation projects proposed for other GoI schemes are presented. No details of the proposed works are given, except the overall costs.
- For the two water supply projects there is no information regarding the source of water, its current discharge and its sustainability or the projected demand. Is the source located inside forest areas or revenue lands? Will there be enough water to give private connections to all the households in the future? What is the water conveyance system? What slopes does it cut through? There is no cost break-up.

- It is well-known that once private connections are given, water consumption and therefore wastewater generation increases. Swajal is silent on this aspect of the water supply projects.
- The second set of projects is for individual toilets and for solid and liquid wastes management. The third list does not clearly identify the nature of the proposed projects . The text of the remarks column suggests that these are probably sanitation projects. There is no justification for why the proposed projects' settlements have been selected. Their priority is not justified.
  
- Swajal does not propose to construct any individual household toilet. It simply proposes to gift Rs 12,000 per beneficiary household. There is no mention of any proposed toilet designs either. It is possible that Swajal has adopted this approach earlier also. Then what is the impact of such giveaways? Has any impact evaluation been done? Given the objectives of the ESZ, it may be wiser to introduce ecosan toilets in the ESZ villages.
  
- The wastewater treatment measures proposed in list two are simply digging of soak pits, garbage pits and some unspecified kinds of drains. At various forums on cleaning R. Ganga and its tributaries, it has been proposed that no treated water should be allowed to flow back into the rivers or streams. Hence the emphasis should be on local recycling and reuse. Also dewats treatment methods and reuse of the treated water for local irrigation are preferable.

#### **e. Irrigation**

- The irrigation department has mentioned of the various flood-protection works that are to be carried out post the disaster of 2013. However, since no site visit has been taken up, it is impossible to comment on the

aspect of the application of the regulatory norms as have been mentioned in the notification.

- The quality of the flood protection works, the type of works being done and the relevance of the same has also to be evaluated. Besides this, the norms of the notification also need to be adhered to and therefore site visits of the monitoring committee for these works is also much required.
- Further, the irrigation department mentions of the unused tunnel made for the then under-construction, now canceled, Ioharinag Pala hydropower project. The department proposes to use this tunnel for cold storage. The restoration of this tunnel is significant for providing strength to the area but the unfinished tunnel is absolutely unfit for being made into a cold-storage. We recommend that this tunnel be made into a dumping zone so that the tunnel could be refilled & that the project proponent – NTPC be asked to construct pillars & support structures in order to give strength to the structure. A detailed site-visit of the area and different remedial measures should be discussed and arrived upon after due consultation with the experts.
- Since all over the ESZ, river diversion works are an absolute necessity after the disaster of 2013, endeavors in this direction have been made by the irrigation department and at many places, channels have been constructed on the main river bed. This however, has seen to be unsuccessful at majority of sites and therefore we strongly recommend forming a team of experts which consists of hydro-geologist, geologists & river engineers along-with representatives of the monitoring committee so that the area can be surveyed and the river water diversion be done in the way which is safest for the residents and is not in violation of the regulatory norms of the ESZ notification. Without this

team, the efforts being made on-ground are futile and wastage. It is pertinent to approach this matter in a holistic and full pronged manner. Details for this should have been laid out in the ZMP.

- The commercial usage of Ganga water is another matter of grave concern. While the department mentions that the 2 privately owned mineral water factories are using the river water since last several years & therefore should be allowed to carry on but the ESZ notification does not allow the extraction of ground-water for commercial purposes. It is therefore pertinent to visit these factories to understand the process and the quantity of extraction before allowing them to go. Perhaps, a few strictures would need to be imposed on the factories as per the guidelines of the notification. This however, can be decided only after a site visit is carried out.
- The protection of hill slopes is a very important activity listed in the department works. The procedure for implementing the same has however, not been elaborated upon. It is pertinent that the latest methodologies in bio-engineering, use of geotextiles etc should be used to ensure proper works of landslide protection. The team of experts formed for advising the procedure of works of river-diversion will also be able to advice on these works.

#### **f. Agriculture**

- Since agriculture forms the "backbone" of this area, it is imperative that provisions/ schemes for benefit in agriculture should be devised. However, the current plan by the agriculture development has not been designed for the ESZ but the existing/ proposed schemes/ plans of the department have been presented as a ZMP.

- The zonal master plan submitted by agriculture department entails the following works in the department:
  - o Input distribution (certified seeds, fertilizers, plant protection chemicals),
  - o crop demonstration,
  - o technology transfer
  - o soil and water conservation,
  - o soil erosion,
  - o rain water harvesting,
  - o protect agriculture land form wild animals,
  - o soil testing,
  - o soil treatment,
  - o plantation of fodder plants and horticultural plants done from different development scheme For the encouragement of increasing production of agriculture.
- The agriculture plan does give details of the different programs. Laid out below are the different remarks of the agriculture department and the respective comments.

Sl. No.	- Name of the Plan/ program	- Remarks
1.	Plant protection program & Plant protection from wild animals	<ul style="list-style-type: none"> <li>- No details have been provided about the programs. If plant protection program is inclusive of the plant protection from wild animals is unclear.</li> <li>- Compulsory adequate fencing around the fields in order to protect the same from wild animals</li> </ul>

2.	Agriculture mechanization	<ul style="list-style-type: none"> <li>- 40% additional subsidy for agricultural equipments has been proposed for farming mechanization.</li> </ul>
3.	Soil & water conservation	<ul style="list-style-type: none"> <li>- The processes/ methodology to be applied for this has not been mentioned.</li> </ul>
4.	Work plan for organic conversion	<ul style="list-style-type: none"> <li>- The chemical pesticides used/ supplied under past &amp; current schemes have to be stopped since the pesticides pollute the ground water &amp; groundwater pollution is a regulated activity of the ESZ.</li> <li>- It is important to convert therefore the agriculture lands for organic farming</li> </ul>
5.	Local bio-resource based industry	<ul style="list-style-type: none"> <li>- Finger millets processing industry has been proposed.</li> <li>- Organically produced pulses &amp; grains packaging and supply</li> </ul>
	<ul style="list-style-type: none"> <li>- Anushuchit jati/ jan jati bahulya gram krishi vikas yojana</li> <li>- Jevik mandua protsahan karykram</li> <li>- Indigineous crop promotion</li> </ul>	<ul style="list-style-type: none"> <li>- Nothing has been elaborated about any of these schemes/ programs so there is no way to understand if these schemes meet the overall objectives of the ESZ.</li> </ul>

	<p>programme</p> <ul style="list-style-type: none"> <li>- Traditional agriculture development programme</li> </ul>	
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- Special Agricultural Zones or SAZs must be highly encouraged in the eco-sensitive zone as it will enhance the agricultural output of the area. The biggest asset of the SAZ is the permission of "Chakbandi" which shall allow a farmer to rent out a land just beside his own land which will increase the productivity & reduce the farmer's efforts who will now farm on a larger portion of land instead of divesting his resources, time & energy into his fields located in different parts of the village.
- With effect of this policy, the agricultural land shall be divided into 4 zones based on their height above the sea level. Corresponding crops (suitable for that height) shall be grown. This will encourage cash crops as well as crops of medicinal value.

**g. UJVNL**

- The existing projects of Maneri-Bhali 1&2 mentioned in the ZMP need to adhere to strict regulatory norms as per the ESZ notification. Both the projects have mentioned their minimum requirement of water level which leads to complete river water diversion by the project authorities, leaving the entire river bed dry.
- The primary objective of the Bhagirathi eco-sensitive zone is to protect the last pristine stretch of the river Ganga. Projects or activities that tamper with the river right at the source pose a threat to the flow of the river downstream and therefore it is absolutely important that strict

regulation of releasing a minimum of 60% of water in the main river bed should be applied & adhered to at all times or else the implementation of the notification will not be possible.

- These aspects of the impacts are completely missing from the ZMP and shows that no effort towards applying the guideline have been made by the respective department.
- The projects on the Asi-ganga river that were completely washed off in the disaster of 2012, need to be re-looked at. The topography of the entire valley has completely changed after the disaster of 2012 and therefore the clearances awarded prior to that cannot possibly suffice now & construction of these projects (Asi-Ganga-1&2 & Kakorigad) therefore is not advisable.
- The projects of upto 2MW can be and should be implemented but strict monitoring of the norms of the guidelines in terms of muck dumping, mining etc will have to be carried out. Blasting in these areas cannot be permitted and therefore methods of least environmental impact will have to be applied & considered. The sites for these projects also, however, have to be deliberated & discussed upon as per the specifications of the guidelines of the notification.

#### **h. Rural Development**

- The rural development program entails the following objectives:
  - welfare
  - employment & self employment,
  - housing and
    - i. other developmental needs of residents
- The plan submitted by the rural development department has accumulated the recommendations of the notification but no planning with regards to the works has been done.

- Details of the residential/ non-residential houses program/ proposal have not been laid out.
- The rectification measures for existing households in order to make the structures safe and conducive to the fragile ecology have not been mentioned. The regulatory norms for existing projects have not been mentioned.
- For rural connectivity – walking paths have been proposed. However the details of the paths and the areas disconnected have not been mentioned. Gangotri valley can be promoted as “Walking valley” with the construction of footpaths where green/ walking tourism should be promoted. These paths will also be helpful in boosting the local economy as the pilgrims would be able to go via villages.
- The infrastructure development works have been mentioned but in the absence of the data of the existing infrastructure, its usage etc, the requirement and vision for more infrastructure in the future is a vague projection and needs to be elaborated upon.
- Development of infrastructure for haats & bazaars in the border areas needs much more clarification as the sanctity of the Gangotri dhaam has to be maintained and excessive noise producing programs like sound & light show etc cannot be encouraged in the isolated areas of the border. For such programs, provisions in the Uttarkashi city are recommended.
- Biomass, solar & micro hydel are absolutely unexplored variants of generating alternative power/ energy in the ESZ. It is therefore recommended that these energy generation options compiled with the usage of micro grid & smart grids should be encouraged. This will be helpful in empowering the villages as the electricity production will be localized & therefore consistent.

- The absence of current data in the social sector is a road block in understanding the future projections in the sector. Moreover, the post 2013 disaster social sector report should also be provided by the rural development department so as to apply the rectification measures.
- The department proposes that the power of change in land use should be with the district's office as has been before. In order to monitor the right implementation of guidelines of the notification, we propose that the power of assigning the land use changes be raised within monitoring committee for the ESZ.
- Provision for granting permission to construct roads with a higher degree of cross-slope for various roads should be based on an on-site evaluation of the representatives of monitoring committee for particular segments of road. The relevance of the construction of that road and the sanction of the locals of the area will have to be considered as well.

**Following aspects of generating livelihoods & for the welfare of the residents, as per the guidelines of the notification, have not been included in the ZMP.**

- Local resource based cottage industries like jam-making, handmade soaps, incense making, woollens, handicrafts, bamboo products etc must be encouraged in ESZ. Women cooperative societies (mahila udyog) can be formed for making household products, woollens handicrafts etc. • Sheep rearing for wool, shawl making and other traditional arts and craft like baskets etc. should be encouraged and small local crafts shops set up in a eco-friendly manner selling also local produce like multi grain bread grown from their fields, Soya crackers etc.
- The various options of better employment opportunities can be sub-divided into following categories for smoother implementation:

- Youth engagement programs
  - Women empowerment programs
  - Skill development programs
  - Community engagement programs
  - Tourism development program
- Through skill development programs, the youth, women & men can learn new advancements in farming, orchard plantations, construction of traditional houses, herbiculture practices & can also be trained for community owned renewable energy power plants such as:
    - Developing micro hydel projects owned by communities
    - Developing solar projects for localized distribution of electricity
    - Recycling of garbage (waste to energy programs)
  - Skill development programs and youth engagement programs to educate & illustrate techniques to make traditional housing structures and providing opportunities of employment in the construction of these structures can be practised.
  - Programs to train youth and artisans in Kashta kala (wood carving) can also be introduced. These wooden structures are not only earthquake proof but also more economical & airy.
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#### **j. Electricity Distribution**

- The plan submitted by Electricity distribution department holds no relevance to the ESZ guidelines. The plan has not been designed as per

the guidelines but the already existing schemes and plans have been laid out as “zonal master plan”.

- The details of the various projects have not been elaborated and the laying of transmission lines cover forest areas at many places which have not been mentioned/ detailed in the ZMP.
- After the disaster of 2013, certain villages were exempted from paying the electricity bills. The other impacted villages, however, were not kept in the ambit of providing relief. The current status of this exemption must be analyzed and new provisions for even other impacted villages could be proposed as part of the ZMP of the ESZ.
- The erection of electric cables is a regulated activity in the ESZ. The proposed plan, however, makes no consideration of this.
- A plan to regulate the erection of electric cables should entail the proposition to introduce micro grid structures instead of mega grids. This aspect will have to be integrated with the plan of using alternative sources of generating electricity that is produced locally and is meant for local consumption.

## Conclusion

- The Gazette Notification of GoI of December 18, 2012 calls for the creation of an Eco-Sensitive Zone of the Bhagirathi River headwaters watershed from Gaumukh to Uttarkashi. It calls for the preparation of a Zonal Master Plan (ZMP) to guide developmental activities in the proposed region.
  
- Para 2 of the Notification contains guidelines pertaining to the preparation of the ZMP. Some of the salient features are summarized below and the compliances of the same in the current ZMP plus a few recommendations have been added on.
  
- *Para 2(1) For the purpose of the Ecosensitive Zone the State Government shall prepare in consultation with local people particularly women a Zonal Master Plan.*
  
- Since there were no efforts to propagate the norms & aspects of the notification amongst the residents of the valley, the government had to suffer much opposition in the ESZ by the local residents who have been made to believe that the notification is anti-developmental. The notification, however, does not intervene in the overall development of the area & the residents. Moreover, the notification paves way for introducing schemes and programs that can be of significant benefit to the residents of the valley and also protect the fragile ecology of the area. It is pertinent therefore to introduce new schemes and programs for improving the livelihood of the residents of the area, so that the objective of the ESZ notification is not dissolved in the process.
  
- *2(2) The Zonal Master Plan shall be prepared with due involvement of all concerned State Departments of Environment, Forest, Urban*

*Development, Tourism, Municipal, Revenue, Public Works Department, Environment Protection and Pollution Control Board, Water Resources, Horticulture, Panchayati Raj, Rural Development etc. for integrating environmental and ecological considerations into it.*

- The plans from all departments have not reached the expert members of the monitoring committee. The most important proposals with respect to waste management, revenue etc have not been submitted.
- *(3) The border area development plan and any other plans prepared or to be prepared by the State or Central Government shall be integrated and form part of the Zonal Master Plan .*
- Border area development plan has not been charted & since it is a sensitive matter, we strongly advice detailed discussion/ deliberation towards the same.
- *(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.*
- The watershed development aspect has been touched upon by the forest department, irrigation & the rural development department as well but none of the departments have spoken about schemes to rejuvenate the dried spring water sources in the area, which is one of the important criterion of the ESZ notification. After the partial construction of loharinag pala & pala maneri hydropower projects, several spring water sources were reported to have dried up. Plans to

rejuvenate these spring water sources is missing in all the master plans. Similarly, many villages located in the vicinity of Maneri-Bhali – 2 hydropower project have reported of drying up of spring water sources and revival of the same is also awaited and has been ignored in the ZMP.

- A detailed hydrogeology study is much needed for the area in order to understand the complex network of aquifers in the area. This will also be helpful in groundwater management and protection of spring water sources.
- These aspects have been unfortunately ignored in the ZMP.
- *(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.*
- *(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.*
- *(7) The construction of various buildings, hotels, resorts in the Eco-sensitive Zone shall strictly follow the traditional concepts and architecture of the area. Specific guidelines shall be laid down for the same in the Zonal Master Plan.*
- It would be imperative that construction of huge cement structures that are not aesthetic and also environmentally unfriendly be regulated and discouraged. Instead the old – time, season and disaster-tested

traditional architecture that is earthquake proof, eco-friendly and highly aesthetic should be conducted with a view to adaptation and large scale implementation. All construction should be a safe distance from the river with adequate sewage disposal. Unfortunately many current constructions dump raw sewage directly into the river.

- Cement structures which stay cold in winter and hot in summer consume vast quantities of electricity (often illegally obtained through a connected wire). Older houses made of wood, mud and stone locally available are organic and use minimum energy. Further it would increase the beauty of the area and thus make this valley a truly distinctive area, thereby also encouraging the right kind of green tourists who are appreciative of indigenous culture and interested in preserving the areas they visit. Existing houses should also be rectified as per these guidelines.
  
- *(8) The Zonal master plan shall regulate the development in the Eco-sensitive Zone so as to meet the requirement of local people without affecting the rights and privileges of the bona-fide residents and also ensure eco friendly development for their livelihood security.*
  
- *(10) The Zonal master plan shall encourage development of walking paths for tourism, pilgrimage and local use.*
  
- *(14) There shall be no consequential reduction in Green area such as forest area, agricultural area, etc.*
  
- This aspect has been ignored in many instances. Especially the schemes for road construction showcase many such roads where for a short distance, vast forest land is being proposed for cutting. Such aspects need to be strictly monitored.

- *Besides the above, the notification contains specific guidelines wrt land-use changes (para 12), preparation of Area Development Plans for habitations with populations of 5000 or more (para 13), development and protection of hill slopes (para16), natural springs (para 17), tourism (para 18), hill roads (para 19), natural heritage (20) and man-made heritage (21).*
- Regulation of vehicular traffic is one of the most significant aspects of the ZMP for ESZ. This however has not been attempted by any of the departments. The wild life & the overall serenity of the area is much impacted due to the excessive traffic on roads. The overcrowding and overburdening of the area must be checked so as to implement the objectives of the ESZ notification.
- The distance of 15kms to Gangotri from Lanka could be encouraged to be made on foot, mules, cycles or small sized solar/electric powered vehicles. This would provide direct local employment on one hand and preserve the matchless beauty of Gangotri, the glaciers and the forests on the other. The use of such eco-vehicles could be eventually extended through the entire eco-zone.
- The pilgrimage itself should be conducted on lines that are eco-friendly such as – increased walking, disposing of garbage entirely, banning plastic, avoiding loud music that destroys the silence of the hills, disturbs animals and causes noise pollution, non-pollution of streams where currently tourists are throwing garbage and using soap, etc. Light pollution through excessive lighting should be censored.
- Meditation groves and groves of silence should be established at regular points, instead of resorts, where excessive wasteful lighting and noise and alcohol are the only degenerative ambience.
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*Point (xiv) – **Solid Wastes***

*(3) The local authorities shall draw up plans for the segregation of solid wastes into biodegradable and non-biodegradable components;*

*(4) The biodegradable material may be recycled preferably through composting or vermiculture;*

*(5) The inorganic material may be disposed off in an environmentally acceptable manner at identified sites;*

- Site specific dumping is very important and much required in the ESZ. This has not been given any importance & just careless dumping of the wastes is being done in the entire ESZ. There is not even a single compactor machine in the entire ESZ for separating the biodegradable & non-biodegradable wastes.
- The local people have vehemently protested against this massive dumping in the vicinity of their villages that has become the issue of much concern for the residents of the valley.
- The clear guidelines of the notification are thus not only being ignored but also violated and moreover, the current zonal master plan submitted by the state is devoid of the most important factor of solid waste management issue in the district which needs to be addressed immediately.

Besides this, several other aspects of the ZMP as has been pointed out in the guidelines of the notification are missing and needs much more deliberation in order to submit something that can finally be worked upon in detail & implementation of the same can be initiated. The education sector in the ESZ, the condition of the health clinics, livelihood options for the youth & the residents of the valley need to be deliberated upon. Next steps & immediate actions to be taken are missing from every plan. Simple next steps like ban on plastics, on-site

evaluations for assessment of works being carried out, dumping sites for sewage disposal, restoration works in the ESZ etc are all pertinent parts of the ESZ ZMP and unfortunately have not been given any importance in the plan.

The Gangotri valley is primarily a highly spiritually charged, destination of pilgrimage. It is the place where the Ganga Herself, worshipped by millions, originates. It is the valley where the Ganga flows. Thus all the banks, all the mountains are spots of pilgrimage. Indian culture never separated the Environment from the Spiritual hence our great Spiritual texts, the Upanishads are also called, 'Aranyakas' or born in the forest.

Hence due respect to this factor should be made in all developmental activities.

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