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**Draft**

# Climate Change and Tourism

An analyses of Policy Options

on

Sustainability of Tourism in IHR under Climate Change



**GBPIHED**

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[2015]

## **An analyses of policy options on** **Sustainability of Tourism in IHR under Climate Change**

**Executive Summary** - The prospects of tourism in IHR, which is nature based and linked with climatic seasons and climatic events, may considerably improve under climate change due to – i) increased inflow of tourists to IHR to seek relief from scorching heat/ increased temperature conditions in Indian plains, ii) elongated durations of tourists seasons, iii) new opportunities in high altitude/ remote location based nature/ culture/ adventure/ educational tourism, and iv) enhanced scope in winter tourism. The increased probability of extreme events, CC triggered hazards/ disasters, and continued influence of CC in years to come, however, would continue to haunt the tourism's growth, development, and sustainability in IHR.

The impact of extreme events would be more pronounced for tourism in remote places in vulnerable eco-sensitive zones/ areas; however, the tourism to places in relatively safe areas, and the urban tourist centers in outer Himalaya which are easily accessible or well connected and closer to plain areas would be less affected and enhance further in future. The developments to cater the demands of tourism in urban pockets, might lead to early surpassing of carrying capacity, qualitative dip in clientele, retardation in growth and premature extinction / fall of destinations. The sustainable management of tourism under CC, therefore, would require a multipronged approach comprising considerations of climate safe tourism/ developmental planning, minimization of environmental trade-offs, carrying capacity management, inflow regulation thru economic instruments and number restrictions, management of tourism operations by centralized booking/ benefit sharing/ effective community organizations, and diffusion of pressure thru development of subsidiary pockets, cult and clientele for alternative tourism, system of impact monitoring, and the education, awareness of the guest and host community, etc. The management of urban/ mass tourism centers which would also serve as a transit for tourism to remote locations under CC scenarios, and tourism in vulnerable eco-sensitive zones in remote pockets would require special attention. The major policy recommendations for tourism management and sustenance are summarized below.

### **Key Recommendations –**

1. *Planning Initiatives* – The climate change related hazards/ risks and disaster risk reduction should be an essential element of tourism planning; the guidelines of NAPCC and 'SAPCCs of Himalayan states' be strictly adhered, revisited, and revised in context of broader mitigation planning and uniformity for implementation at regional level.
2. *Tourism management by regulation at places at the verge of carrying capacity* – Most of the urban tourism centres which also act as base point/ transit/ gateway for tourism to interior places in Himalaya are part of this category, tourism at these places would require regulation through a system of centralized booking of accommodation/ travel, use of economic instruments, diffusion of tourist pressure thru development of subsidiary tourist pockets in vicinity/ suburban areas, and a combination strategy of centralized booking, diverse packages, and number restriction etc.
3. *Tourism management regulation at pilgrim places/ shrine areas of mass tourism places in sensitive environments* – These represent the places in sensitive ecology highly vulnerable to extreme events, tourist safety and capacity to ensure safety in

such places is also important. The regulation in such places is suggested thru use of permits, restricting entries to few days of a week, time and number restrictions, and combination of permits-number restrictions (tourists & vehicles), phased entry and exit by developing new transits & purpose specific circuits.

4. *Management of carrying capacity* - Managing tourism and tourism induced development within the destination carrying capacity to sustain the quality of touristic ambience and experience is an important concern; similarly the interests and concerns of host and their stake-building is also important. Internalization of overgrowth of destination by systematic development of satellite pockets, use of technological and participatory measures for maintenance of ecosystem integrity of destinations and tourism resources, improving resource/ environmental governance thru better enforcement, jurisdictional clarity, and co-ordination, institutional reorganization and reforms are some measures that need to be looked into.
5. *Management of visitor safety from climatic threats by efficient network of 'Prediction and Early Warning'* – Accurate prediction of climate hazards and linking tourism operations management with Climate Hazard Information Network is an important issue, can help ensuring tourists safety provide confidence for tourism activities/ enterprise participation in the area.
6. *Manipulating tourism activities and clientele* – The mass tourism in IHR though economically important does not provide the benefits to remote communities and also ecologically damaging. Therefore, there is a need to promote the low impact variants of eco-tourism/responsible tourism by incorporation of such activities a essential component of tourism packages, and by harnessing the new opportunities that would be evolving under CC. A system of guides/ instructors would also help building a better understanding of tourism intricacies and clientele.
7. *Managing the ongoing issues of tourism* - Under the CC scenario, as a result of increased incursion of tourists the negative impacts of tourism would significantly enlarge; therefore development and stricter enforcement/ compliance of regulatory norms for waste management, traffic regulation, urban proliferation and building codes would be required. Periodic assessment of tourism impacts and visitor feedbacks also would significantly help.

# **Sustainability of Tourism in IHR under Climate Change – Analyses of Policy Options**

## **1. Tourism, the General Relevance**

Tourism is one of the largest and the fastest growing industries in the world, and contributes to around 9.5 % of Global GDP and 9.1% of the global work force<sup>1</sup>. In 2014 the total international arrivals (ITAs) in the world was 1133 million and annual international tourist receipts (ITRs) was US\$ 1248 billion. India's share in the world in terms of international arrivals was mere 0.68% (41<sup>st</sup> rank in the world) and 1.65%(15<sup>th</sup> rank) in terms of ITRs, and its foreign exchange earnings from tourism US\$ 20232 million representing a growth of 9.7% from the previous year. However, India has a huge potential in domestic tourism, which brings large money into circulation providing support to the growth of enterprises and employment. In 2014 total tourist arrivals to states and union territories were 1312.68 million (domestic - 1290.11million, International – 22.57 million), showing a growth of 36.98% per annum from year 2000<sup>1, 2</sup>. As per the tourism Satellite Accounts (TSA) of India estimates for year 2012-13 tourism's contribution to GDP and employment were 6.7%, 12.4% respectively.

## **2. Why to Sustain Tourism in IHR**

The IHR which is full of natural bounties, pristinity and wilderness of environment, and harbours shrines and solitude that attracts a large number of tourists every year. The tourism's significance for the region is widely acknowledged in state and national planning circles, and it is being promoted across all the IHR states as a priority sector with enough potential to revolutionize the economy of the region. The constraints of hill specificities, limited developmental avenues, and the conservation value of the IHR - as a part of water tower of Asia, ecosystem flows for down-stream societies and economies, and biodiversity also exalts tourism's relevance for the area which offers a land-use most compatible with the fragile environmental conditions of the region. In addition, the tourism provides ample opportunities for the growth of small scale enterprises, has wide ranging multiplier spin-off impacts transmitting benefits to a larger section of the society, and given some basic facilities it grows spontaneously by attracting investments from public and private sector in small, medium and large enterprises and infuses better equity in the system. Now, with concept of eco-tourism gaining ground it is also helping development of a niche market in the remote distant pockets of nature maxima in IHR, providing a basis of nature conservation and means for subsistence for the local communities of those areas. Therefore, considering a wider relevance of tourism for economy, environment, and culture, there is a need to conserve its economy and explore ways of its sustainable management.

## **3. Tourism scenario in IHR, Climate Links and Issues**

The IHR has long history of tourism which evolved with pilgrimage to the shrines and religious places in the far-flung remote pristine environments. In independent India the hill towns established by British during colonial times developed into hill resorts, and later became the gateway and centres of climate based urban commercial tourism that served towards spectacular growth of tourism in IHR. Later under the influence of environmentalism and the new developmental paradigms, tourism in IHR like elsewhere got further diversified and several low impact alternative variants such as adventure/

rural/ cultural/ biodiversity/ wildlife/ nature tourism etc. emerged with the passage of time. Today the tourism in IHR can be categorized in the following three broad categories-

- i) Commercial Urban/ Leisure Tourism
- ii) Religious Tourism
- iii) Nature and Ecotourism

In year 2014 (provisional statistics) the tourist inflow to IHR states was 50.09 (105.32) million of which the share of Assam and West Bengal was 55.25 million; the inflow statistics shows an overall growth annual of 22.04% from year 2001, and 10.65% without including Assam & West Bengal (Fig 1). The domestic tourism is the dominant

form in IHR, the foreign tourist comprise only a paltry 2-3% of the total tourist inflow in the region. The commercial and religious tourism constitute the larger clientele of IHR tourism; the alternative variants have very limited clientele and there are very few pure nature and eco-tourists. This type of tourism has mainly evolved as an intervention/ side activity in the

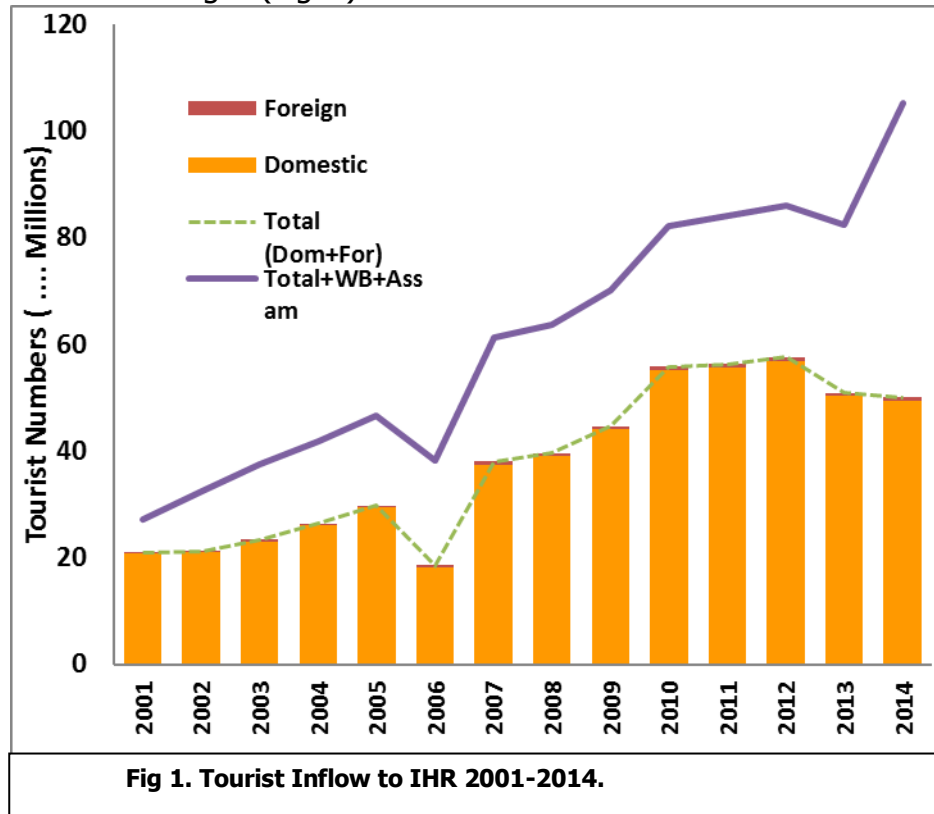


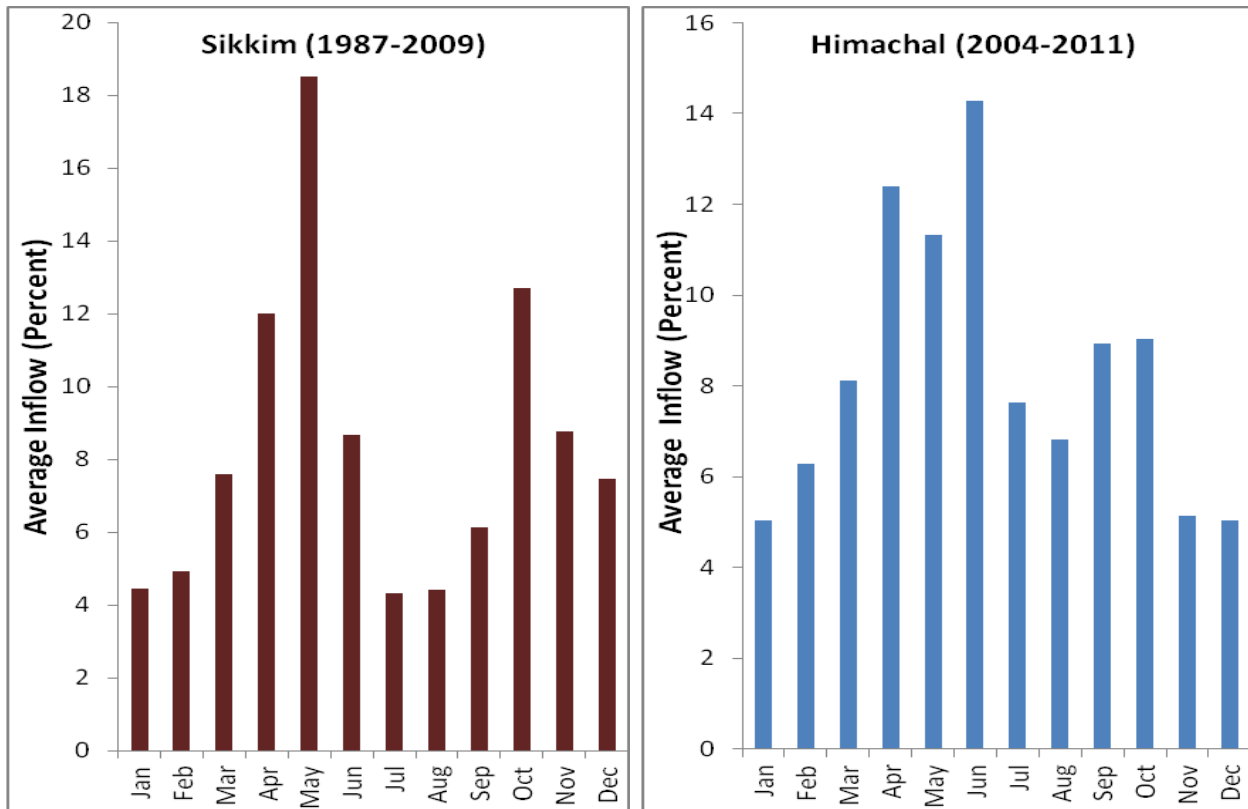
Fig 1. Tourist Inflow to IHR 2001-2014.

backdrop of existing tourism to minimize

the negative impacts of disproportionate growth of mass tourism and off late also to promote the development of communities and places in the remote distant locations in Himalaya.

#### 4. Climate Links of IHR Tourism –

Historically, the tourism in IHR, whether religious or leisure is mainly climate based and related to high temperature conditions in plain areas and pleasant weather conditions in hills, and snowfall events (climatic events) during winters; the summer and autumn months are the main season periods and monsoon and winter usually are the lean periods. The summer and autumn seasons varies with the severity and geographical distribution and strength of monsoon which has a receding influence from east to west. The distinct bimodal pattern of tourist inflow which is very clear for Sikkim and Uttarakhand becomes somewhat blurred on westward transition<sup>3</sup> i.e. Himachal Pradesh which has less monsoonal influence (Fig 2). In the past the winter period used to be the lowest or no tourist activity period, now under the influence of climate change a switch in this pattern towards rainy season is being observed (Table 1)<sup>4</sup>. The analyses of tourist



**Figure 2. Profile of Average Monthly Inflow of Tourists to Sikkim and Himachal Pradesh**

trends show proliferation of summer season towards the month of March, and increased rush during last fortnight of December and early January which coincides with the period of snowfall the Himalayan region. As a result of changing climate, the craze for this snow bound winter tourism is gradually building up, introduction of some winter tourism activities are also helping in this context. The variation in patterns, therefore, may be seen as an influence of climate change <sup>4</sup>.

**Table 1. Monthly and Quarterly Distribution of Tourist Inflow in Sikkim**

Monthly Pattern		Quarterly Pattern				
1987-2010		Quarter	1987-1995, N=9		1996-2010, N=15	
Month	Av. Inflow (%)		Av. Inflow (%)	Min Inflow Frequency	Av. Inflow (%)	Min Inflow Frequency
January	4.66	Q1	16.02	7 Times	18.84	-
February	5.25					
March	8.44					
April	13.14	Q2	34.74	-	41.09	-
May	18.79					
June	8.66					
July	4.01	Q3	12.91	2 Times	14.48	15 Times
August	4.53					
September	6.13					
October	10.57	Q4	27.66	-	25.60	-
November	8.48					
December	7.33					

(Source – Joshi *et al.*, 2012<sup>4</sup>)

## 5. Sustainability Concerns with Tourism & Issues in IHR -

In theoretical terms the development and growth of tourism is cyclical<sup>5,6</sup>, which is characterized by a boom phase followed by a bust course. Its growth involves trade-offs with its resources and the destination environments. Its life-cycle and growth trajectory i.e. transition through different stages of boom part and transgression to bust course, is determined by physical, social, and biological carrying capacity of destinations/ destinations' environments, the tourist characteristics, and the satisfaction derived from quality of tourism experience that is offered, which in turn is governed by the degree of developmental trade-offs. The trade-offs of unmanaged growth of tourism, or growth beyond carrying capacity results in degradation of tourism resources/ destination environments, hence a phased dilution in touristic experience, adversely affecting the tourist clientele and sustainability of tourism in the long run through decline of destinations. The cyclic pattern of tourism's evolution and growth, and decline of destinations is inherent in the characteristic dynamics of tourism. The development and management of tourism, from sustainability perspective, therefore, needs a careful consideration of destinations physical, cultural, and ecological limits. In Himalaya where ecological tolerance is low, communities are deprived, and poverty is pervasive, there is a need to minimise the developmental trade-offs with holistic long term integrated developmental planning. Some major issues related to sustainability of tourism in IHR are referred in Box-1.

### **Box 1**

#### **Tourism – Common Sustainability Issues and Problems in IHR**

The common sustainability issues of tourism in IHR are as under:

- i) Risks of high cost of developmental trade-offs for fragile/ sensitive Himalayan environment/ tourism resources; overgrowth related risks/ threats to tourism and other sectors and settlements; infrastructure development in tourist places and for access to tourist places in IHR therefore needs cautious trading
- ii) Managing growth beyond carrying capacity related to large inflows/ overcrowding in case of leisure tourism areas and places of shrine tourism, growth of tourism and associated urbanization & related environment problems, maintaining essential supplies, cluttered growth of settlements, problems of traffic, solid-waste, guest-host frictions and negative interactions, etc.
- iii) Mass tourism in shrine areas located in sensitive habitats which are vulnerable to natural hazards disasters, and in terms of their environmental sanctity, ecology, & culture etc., besides degradation of quality of the eco-cultural experience can also trigger disasters; therefore, control of constructional activities, resource extraction for tourist needs, and tourist safety and mechanisms for inflow management are the most imminent needs
- iv) Underdeveloped ecotourism and limited clientele for eco and alternative tourism
- v) Problem of waste, its collection and disposal, & no system of community hygiene
- vi) Lack of mechanism for orientation, education, and awareness of tourists
- vii) Weak policy arrangements/ synchronization and isolated working
- viii) Uncoordinated management of tourism resources, lack of cross sectoral thinking, lack of conservation funding
- ix) Weak community participation/Institutions and enforcement
- x) Plummeting value system and social pressures for observance of ethical behaviour for use of environment / natural resources
- xi) No mechanism for impact monitoring and feedbacks, travel care and enhancement of quality of experience

## **6. Implications of Climate Change for Tourism**

The climate change, which refers to general increase in temperature and changes in humidity and rainfall patterns, is expected to delineate the changes in weather conditions in Indian subcontinent in terms of - warmer summers, warmer winters at higher latitude/ altitude areas of Himalayas, erratic patterns of rainfall (monsoonal rains), and increased intensity and frequency of climate based extreme events. This phenomenon, in turn, is also expected to bring about changes in community composition, vegetation patterns, habitats of species, and niche space resulting in increased competition for resources, shifting and extinction of species, etc. This in the long run would also affect the cultural practices, traditions, knowledgebase and institutional settings associated with production, extraction, and use of natural resources. The likely implications of climate change for tourism in IHR can be summarized as under –

**6.1. Increase in Tourist Inflow and Duration of Season Periods** - The uncongenially hot summers in Indian plains and general rise in temperature all across including the IHR, would enhance the development and growth prospects of tourism through increase/escalation in tourists' inflow volumes/ inflow growth and expansion of season periods resulting through proliferation of summer season towards late springs and autumn towards beginning of winters. The increase in tourist incursion would create extra pressure, particularly, on infrastructure, transport, demand-supply, and natural resources of gateway destinations/ popular urban tourism centres with carrying capacity impacts. Further, the warmer/ pleasant weather conditions will improve access and duration of visits to remote, high altitude areas of pristine environment and culture. This will also increase distribution of tourists over larger geographical area, provide income and employment opportunities for communities in remote areas, and create opportunities for high altitude nature and cultural tourism.

**6.2. New Opportunities in Winter Tourism** - The warmer winters in higher altitudes, increased number of winter sunshine days in hills, and dense foggy conditions in Indian plains, a pattern which off-late is being observed, would create and enhance the scope and opportunities in winter tourism. The scrutiny of recent inflow trends reveal signs of gradual build-up in winter tourism (which off late is also becoming manifest in recent trends).

**6.3. Increased Thrill in Adventure, and Avenues in High Altitude Nature/ Cultural Tourism** - The warmer conditions and melting of snow, ice, and glaciers would improve access to high altitude pristine wilderness areas, increase visit durations, create more congenial environment for expeditions, trekking, etc. activities, and provide a larger unexplored geographical domain to explore. Glacier melting however can increase the flood probabilities, and hence the risk in the adventure activities such as rafting. This also poses threats to downstream/ riverside tourism infrastructure/ and road network.

**6.4. Biodiversity Changes and Educational/Knowledge Tourism** – The climate change as envisaged will bring about changes in vegetation composition and result in shifting of species; the Himalaya which is characterized by high variability of topography and environmental gradients, the spatial connotation of such changes would be enormous. Such changes will be accompanied by changes in habitat patterns and niche space which have a long chain of cascading impacts for the food chain, biodiversity, environmental aesthetics, and resource dynamics and associated traditional practices, knowledge, and



institutions. This will create tremendous scope for educational tourism in Himalaya, especially in the high altitude regions.

**6.5. Tourism Threats from Melting Glaciers, Biodiversity Loss, and Extreme Events** - The increasing intensity and frequency of extreme events poses severe threat that can completely wipe away/ wash out the tourism resources & centres (settlements), forest & biodiversity, infrastructure, transport & communication network, support facilities and service sectors. Such incidents also involve risk of life for tourists and host communities and service providers in destinations and vulnerable areas in transit locations. Events like cloud burst and heavy rains can aggravate the flood risk associated with melting glaciers, and also adversely affect the biodiversity based tourism in remote locations as a result of wiping out and successional loss of biodiversity. The recurrence of incidents like Kedarnath Tragedy - 2013, Kashmir Floods – 2014, can have long term detrimental impacts for tourism.

**6.6. Threats of Accelerated Tourism Induced Global Change, and Access to Markets** – The contact effect and acculturation, and for arrangement of provisions for tourists also brings effects of global change and improved access to markets. The climate change resulting in increased prospects of tourism will speed-up this process, which will result in a complete change in agricultural traditions, loss of traditional landraces, lifestyle changes, abandoning of agriculture, diversion of agriculture land for tourism purpose, and also adversely affect the scope of cultural tourism in the long run.

## **7. Sustainability of Tourism under Climate Change – Management Solutions**

The climate change is an ongoing process, and the climatic hazards are destined to occur; the implications of such hazards can be severe for structurally fragile and vulnerable Himalayas, and can thwart and disrupt the processes of economic development affecting their sustainability. The sustainability of tourism is likely to be threatened by the changes in tourist inflow, threats of extreme events, and the trade-offs associated with catering to increasing demands of the sector. The climate change will also create new opportunities in high altitude/ and remote location based nature, culture, education, and adventure tourism, and spread of tourism over a wider geographical expanse. The sustainability of tourism therefore requires holistic planning and internalization of climate threats by opportunities, and actions in light of the existing issues and problems of the sector. In this reference some of the approaches that can be tried for managing its sustainability under climate change are –

**7.1. Minimization of Developmental Trade-offs** – Tourism's growth involves trade-off with tourism resources and destination environments, unmanaged tourism and its over growth, results in degradation of these resources and environments, and dilution of touristic experience, adversely affecting its clientele, and future growth. These trade-off costs are high in Himalayan systems characterized by high geological fragility, and sensitive ecology. The tourism should be developed in a planned way so that the pressure on critical resources is minimized, and its development is reconciled within the ecological limits of the destination. The tourism planning should therefore, factor in the ecological and fragility concerns of the Himalayan environment. For actions at micro-level guidelines for environment and resource protection, quality upkeep should be made for follow-up across IHR.

**7.2. Incorporation of CC and Disaster Risk Factors in Tourism Development Planning** – The Himalaya is vulnerable to disasters, and the extreme climatic events, are likely to aggravate the intensity and fury of disasters in fragile settings and socio-economically backward society. Such disasters can damage and wash out the tourism infrastructure, roads & communication networks, the support facilities and cut-off the essential supplies to destinations. The guidelines of NAPCC and SAPCCs of Himalayan states should be adhered to, and revisited and revised for uniformity for implementation.

**7.3. Inflow Management at Urban Tourism Centres at the verge of Carrying Capacity** –The commercial / leisure tourism in IHR is mostly confined to urban centres like Shimla, Manali, Dharamshala, Nainital, Mussorie, Gangtok, Shillong, etc. The tourist inflow to many of these places during season time, particularly during the summer season, time increases considerably beyond their carrying capacity. The impacts are revealed in terms of overcrowding, traffic jam, heaps of dumped waste, vehicular pollution and vibrations, un-hygienic conditions, short supply of food items and price hike, hike in stay and cost of private transport, and extortion of tourists, in-migration of labour force in large numbers, squatting and encroachments. Such developments affect the quality of touristic experience, and create a bad image of the destination in tourists' minds; over the years a qualitative change in tourist clientele, through phased ouster of quality tourists, is being perceived. The catering to increased rush and overcrowding is resulting in cluttered/ congested and inferior type of development which is not comforting to tourists interests. Therefore, inflow management is important to maintain the quality of experience, and prevent inferior overgrowth of the destinations. The following measures are suggested –

- a) *Inflow/ entry management by centralized booking of available accommodation and tickets to local attractions* – A centralized information data base on availability of accommodation etc., can be developed for managing entry to destination during the season times.
- b) *Inflow management by use of economic instruments/ fees*– The economic instruments should such as tax on stay, entry of vehicles increasing with stay days should be levied. A price floor on tourist stay during season period can be used.
- c) *Inflow management by engaging tourist through activity diversification in subsidiary tourist pockets* – The different variants of tourism based on the natural, cultural specificities of the area can be developed to divert the tourist traffic from the main centre. The differential pricing or competitive lower floor price for accommodation in subsidiary/ satellite places can be used as an incentive mechanism.
- d) *Combination strategy of centralized booking and package of activities with specified days at specified place* – This can help in tourism regulation, and its organized expansion to subsidiary areas; diverse package set (micro-circuit sets) with numbers can also be developed.

**7.4. Inflow Management of Mass Tourism Areas in Sensitive Environments** – The high altitude shrine areas in interior Himalaya, mountains and sacred lakes, and glacier points namely, Badrinath, Kedarnath, Gangotri, Yamnotri, Valley of Flowers, Mani-Mahesh, Aadi Kailash, Om-Parvat, Gurudongmar, Tsomgo, Nathula etc. are the destinations located in eco-sensitive environment in interior Himalaya which are prone to natural disasters and highly vulnerable to climate hazards. Also travel to these places involves long journeys through a geologically fragile mountainous area, susceptible to landslide, land creep, and rock-falls. The heavy traffic or vehicular vibrations of large number of vehicles through

such terrains weaken the stability of landmass, and rainfall in such areas often results in road-block, road subsidence, people stranded for long hours and days. Therefore, at a point of time, only entry of limited number of persons and vehicles to such places be allowed; the following measures can be used to regulate the entry.

- a) *Regulation of numbers tourists and vehicles through permits* –The entry of only fixed number of persons and where applicable vehicles on per day basis can be allowed, the use of permits for entry and days of stay in the region be used. The numbers allowed can be decided based on minimum time that is deemed sufficient for consumer satisfaction and to meet the common avowed objectives of the visit.
- b) *Regulation by restricting entries to few days of a week* - Banning entries on alternate days or restricting entries to few days of a week can be quite useful for regulation of tourism in places of vehicular tourism/ or limited infrastructure.
- c) *Regulation by 'time and number' restrictions* – The places which are located in more sensitive environments, and where there is a greater rush of visitors and day tourism is practiced, and increased interaction with resources affects the sanctity, and USP of that environment, regulation of time together with numbers can be practiced. The permits however should be used for regulation.
- d) *Time and number restriction with permits and economic instruments* – This could be a stricter/ effective measure, and can be used for inflow regulation depending upon the volumes of seasonal inflow and the environmental, religious, strategic sensitivity and sanctity of the place/places. This can be used to dissuade the stay in such places, a time slot based environmental tax/ conservation fee, increasing with duration of stay can be used. Alternatively, also a differential price floor system increasing with duration of stay can be used. The amount/ size of the tax or fee should be decided based on the sensitivity of the locations and cost of facilities and risk probabilities.
- e) *Phased entry and exit with diversified/ purpose specific circuit building along the transit by developing/ connecting new places (circuits)* – The number restrictions can be practiced by breaking the to and fro journey at different transit points i.e. at three/ four places, and sending visitors in successive groups, one replacing the other in an orderly sequence during onward and return journey. The purpose specific circuits such as pure spiritual, pure adventure, or mixed experience plans can also be developed to cater to tourists/ visitors requirements for providing quality experience. This will help in wider distribution of tourists, expansion of income/ employment opportunities, equitable spread of benefits, and reducing pressure on certain places and routes. This will help in stake building of inhabitant people in tourism and invoke better participation.

**7.5. Management of carrying capacity** – The carrying capacity of destinations/ destination resources is an important concern in tourism. The sustainability or life of tourism in a destination depends upon the compliance of cut-off limits of the physical, social, and biological carrying capacities of the destinations. Most of the urban tourist centres have already grown beyond their carrying capacity, and the sensitive environments are vulnerable places which have low capacity with regard to developmental possibilities, supply management, accommodation, and resource provisioning and impact resilience. Under the influence of climate change, as a result of increased demand, the

pressure on carrying capacity of these destinations would increase; the measures can be adapted to counteract such situations.

- a) *Internalizing the overgrowth concerns of existing destinations by systematic and planned development of satellite pockets* - The carrying capacity concerns of established tourist towns should be internalized by decentralized planning/ development of tourism infrastructure in satellite/ suburban areas. Unlike the existing destinations, these centres/subsidiary centres should be developed in planned way with due regard to carrying capacity and a developmental master plan, with complete clarity about tourist activity sets/ experience to offer, accommodation capacity, provisions, markets, and recreational spots etc. The further developments in core zone of these towns if affects the resource quality should be banned/ disallowed.
- b) *Practising technological and participatory measures for maintenance of ecosystem benefits and Resource Conservation*– The conservation of background tourism resources and key/ critical resources water bodies/ forests etc., which contribute to natural aesthetics of tourist places and important from the point of view of meeting the essential provisioning services, and survival needs of life forms of the local ecosystem, is important. Therefore, suitable engineering, bio-engineering, and participatory measures should be taken to protect and safeguard these resources.
- c) *Improving enforcement, jurisdiction, and co-ordination* – The most of the carrying capacity violation problems are associated with poor political ecology of developments related to multiplicity of departments, jurisdictional ambiguity, poor enforcement of laws/ by-laws, lack of policies pertaining to environmental governance, and uncoordinated management of key resources. Tourism being a very diverse industry draws support from and helps the growth of other sectors. Therefore, the performance and growth, and decisions of other sector also affects its growth, and at micro stage the management and development decisions/ and environmental trade-offs of other developments (town planning and management & execution) also affect its development and carrying capacity. The tourism also suffers from reasons ulterior to the sector; therefore, in future, for development of tourist destinations a holistic cross-sectored triangulation for resource conservation and tourism facilities is required.
- d) *Managing social carrying capacity* – The tourism results in increase in cost of living, general rise prices, social pollution, law and order problems, and scores of negative social/ cultural impacts in destination areas. This generates apathy, and antagonism amongst the host populations. This affects the hospitable environment, warmth of destination and creates guest-host frictions, which affects the quality and longevity of tourism. These problems can be to some extent be overcome by education and awareness of hosts about the benefits/ opportunities, their involvement in tourism - by creating livelihood opportunities in local crafts/ products and tourism services, tourism planning and management, and through community organization and empowerment, etc. measures. Organizing operators for centralized booking of travel and stay, and participation of stakeholder groups can go a long way in maintaining the sustainability of tourism thru excellence in art/ crafts, managed distribution of spin-off chains, and acknowledgement of stakeholders concerns in overall development/ management of tourism. The awareness of tourists on code of conduct, and responsible behaviour can also help.

**7.6. Managing visitor safety from climate threats through accurate predictions and early warning system** - The extreme events can destroy the tourism infrastructure, inflict visitor casualties, and severely affect some adventure activities like mountain expedition and rafting. Therefore, planning and management of tourism operations climate sensitive activities should be supported by expeditious communication of climatic hazards information from climate monitoring/ meteorological agencies. Community engagement, guides/ and trained staff, to manage visitor safety and speedy rescue is also important.

**7.7. Promoting low impact alternative variants of tourism** - There is a need to develop a new cult and clientele in low impact variants of tourism such as eco-tourism, responsible tourism, and sustainable tourism. This will help in diffusing the incursion pressure in mass tourism centre, and managing new/ future tourism in a sustainable manner. This can be done by –

- a) *Incentivising the low impact eco-tourism/ responsible tourism through incorporation in existing tourism packages* - The low impact variants of tourism in IHR have a very limited clientele and this can be developed by – i) making such activities a mandatory component of all tourist packages, ii) promoting such activities by quality designs at subsidized / discounted offers. The cost of such offers can be borne by as incentives to tourists by the concerned states or by a part of conservation fee. The establishment of clientele for such variants will help both the promotion and growth of sustainable tourism, and the sustenance of tourism.
- b) *Harnessing upcoming/ new opportunities under CC to develop low impact variants of sustainable tourism* – The climate change is likely to create many new opportunities of nature, culture, adventure, and educational tourism, there is need to combine the past experiences/ learning and develop the new tourism in Responsible/ Eco / and Sustainable formats, this will help in transmission of tourism benefits in remote locations, and help people in deriving eco-friendly lifestyles/ subsistence, outmigration check, and better participation for conservation of their heritage/ resources, and management of tourism.

**7.8. Eliciting positive tourist behaviour through system of guides** – It is very important to instruct and educate tourists about the technicalities of touristic activities, and necessary precautions to be taken for their safety and conservation of tourism resources and environment. Well trained guides in this respect can be very useful, instruction about activities and technicalities will also help in development of inquisitive acumen amongst tourist that will help in comparing experiences, and developing a taste for different types of touristic activities. The guides are also useful in monitoring and controlling the tourist behaviour.

**7.9. Management of negative impacts of tourism** – Under the CC scenario, the ongoing problems associated with tourism would aggravate further due to enlargement of negative impacts. The traffic congestion, littering of waste, encroachments on commons, and maintaining law and order situation, quality of touristic experience are some of the problems that require immediate attention. The following measures in this respect can help –

- a) Development of regulatory norms for a system of waste collection, segregation, and disposal; completely banning use of polythene; 4-R schedule of waste management; use of fines and penalties
- b) Traffic management through restricted entry; time based parking charges; designated parking places; and permits, fines and penalties
- c) Establishing a system of regular monitoring of tourism impacts and feedbacks
- d) Codes for community hygiene, settlement aesthetics, and implementation of best practices

The limited development avenues in IHR warrants that the tourism which carries high potential for economic development of the region should be carefully nurtured and sustainably managed. The tourism in IHR which is mainly climate dependent, is likely to get further spurt under climate change; the increased probability of extreme events, and long lasting influence of climate change, however would continue to haunt the touristic developments and growth of support sectors for many years to come. The impacts of climate change would mainly be manifested in terms of escalation in tourist inflow, associated increased touristic development and pressure on carrying capacity of urban centres of mass tourism and tourist places, emergence of new opportunities in tourism and spread of tourism over wider geographical extent due to increased access and season timings, opportunities in winter tourism, increased threats of climate disasters and hazards, and enlargement of negative impacts of tourism. The impacts would be more pronounced for the existing mass tourism destinations, and pilgrim/ religious tourism destinations in sensitive environments. Minimizing developmental trade-offs of tourism within carrying capacity limits, inflow management, diffusing tourism pressure in rush areas through tourism development in subsidiary pockets, building clientele for/ promoting culture of low impact tourism, and evolving a system of tourism impact monitoring, and education and awareness are some set of measures that can help maintaining the tourism's sustainability in the long run.

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