

Report on Tourism and Waste in Uttarakhand

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WASTE GENERATED BY TOURISM; LOOKING FOR ALTERNATIVES FOR MANAGEMENT OF WASTE GENERATED BY TOURISM SECTOR IN UTTARAKHAND

ABSTRACT

Indian Himalayan Region being an ecologically sensitive zone and a pertinent provider for ecosystem services such as water, food and energy, becomes extremely important to protect the region to be able to extract its “services” sustainably. With rapid economic development leading to rapid modernisation and urbanisation, the Indian Himalayan Region is under threat. Tourism has been one of the fastest growing sectors especially in the Indian Himalayan Region. It has become one of the major sources for employment opportunities for the local mountain people. According to a report by Niti Aayog in 2018, tourism and hospitality sector itself accounts for US\$ 71.5 billion to the GDP, the 12th Five Year Plan itself advocates for pro-poor tourism. It is without question that the income generated by tourism especially in the Indian Himalayan Region is manifold and has no other lucrative alternative. But the question here arises is the tourism sector is sustainable in such an ecologically fragile zone and what impact does it have on climate or towards achieving SDGs.

One of the main consequences of the rise in tourism has been mindless disposal of waste, the waste generated has an exacerbated effect on the ecological balance of the whole ecosystem. It is here that the overall waste generated, the steps taken by the government and the non-state actors are put under scrutiny. Through this report, it would be highlighted how the waste generated has exacerbated the overall fragility of the Himalayan ecosystem and what alternatives in terms of initiatives and policy formulation and implementation can be adopted in sustainable development in the region.

Key words: PPP partnerships, zero waste, sustainable tourism, ecotourism, adventure tourism, extended producer responsibility, community-based waste management, SDGs, ecosystem services.

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Chapter 1 - Introduction

At present, tourism is one of the fastest growing sectors in the Indian Himalayan Region (IHR) and is expected to grow at an average annual rate of 7.9% from 2013-2023.¹ With the Himalayan region offering pristine views of the valleys, clean air, adventure sports, mesmerising landscapes, they become a natural choice for tourism especially during the summers where the people look for destinations which offer a cooler climate. The recognition that tourism can be a key driver for economic growth and development has been even recognised by the government. The 11th Five-year Plan recognised tourism being the largest service industry in India and emphasised its importance for economic development and employment generation, especially in remote and backward areas such as the Indian Himalayan Region. Additionally, the 12th Five-Year Plan propagates pro poor tourism for inclusive growth.

Post 1991 Liberalisation reforms, the services sector has gained manifold. In the Indian Himalayan Region, this has trickled down into the rise of the tourism sector especially the hotel industry and adventure sports. With economic development being the priority of the government, the state governments of the Indian Himalayan region followed a similar path of capitalism discarding ecological sensitivity. The ambiguity and lack of regulations in place to check the unprecedented and unsustainable growth in IHR, has exacerbated the sensitivity of the region and have led to furthering the vulnerability of the region to natural calamities. Even if the laws have been formulated in this regard, there have been instances where the private companies and individuals evade such regulations for their own profit. Lack of checks and balances in the region is a pertinent issue which needs to be addressed in the future by the respective state government.

To elucidate on this further, it would be of relevance to mention about **Rakshit Joshi vs. The State of Uttarakhand**². The petition brought into light the violation of environmental norms and violation of the orders of the High Court in regard to protection of Bugyals. The reason for filing the petition was that the Government of Uttarakhand had allowed a large-scale wedding to take place in “Auli” in district Chamoli, Uttarakhand. The argument put forward by the petitioner was that a “bugyal” which is an eco-sensitive zone cannot be used as a destination for weddings. A Bugyal is a name given in the local language to Alpine Meadows which is an ecosystem in itself. The single event itself left a trail of 36.2 tons of garbage, with no facilities available for scientific disposal of waste and no mechanism in place to prevent air and water pollution which would result as a consequence of such activities, it is safe to say that the ecological balance of the area would be in serious danger. Such evasion of the previous judgments has left the state in a fragile situation which would lead to unsustainable development of the area and lead to degradation of biodiversity and ecosystems existing in the area as a whole.

¹ (Niti Aayog, 2018).

² Writ Petition (PIL) 74 of 2019

1.1 Ambiguity in the Development Policies Introduced by the Government To give a brief overview of the overall policy towards development by the government, it is important to contextualise the cause behind the frequent occurrence of floods, landslides and other catastrophic disasters which leads to the loss of hundreds of lives.

The recent developments in Uttarakhand, especially the February Chamoli tragedy and the government's decision in November to denotify 87 hectares of reserved forest to allow the expansion of the Jolly Grant airport outside Dehradun, clearly show the government's disregard to the ecological fragility of the mountain ecosystem in the state. The government giving primacy to economic growth over development has proved disastrous in the past starting from the 2013 flash floods.

The very reason for creation of a new state from Uttar Pradesh was to account specific development needs the mountainous ecosystem demands due to the differentiated geography and social structures which were dependent on these ecosystems for their livelihood (Joshi, B.K.), this has been rather ironical as the government has hardly taken account into the differences and has treated the state no different from a state dominated by plains.

Development, no doubt, is an essential part for any national and state policy. However, this should not overrule sustainability. Before the construction of any development project, the government is mandated to conduct an Environmental Impact Assessment or EIA. Pre-2020, the EIA was mandated to conduct a thorough study of the environment, biodiversity and the social dimension of consulting with various stakeholder groups. This step has been removed in the new EIA (2020). Local people are caretakers of their environment. But their inputs to new projects have been severely reduced. The now-destroyed Dhauliganga dam's EIA was conducted during the time of a more robust EIA. Yet, it was the epicentre of both, the 2013 and 2021 Uttarakhand floods. This indicates that the EIA in its current (and previous) form is not good enough. The government cannot risk life and ecological integrity at the cost of short-term development.

The budgetary allocations have not accounted for sustainable development, for example in the 2013 budget, there is a visible decline in taxpayers' monies allocated to sectors that provide for inclusive and sustainable development, including nutrition and welfare schemes, and research in ecology, environment and oceanography.³ This clearly shows the hegemonic discourse of economic growth over environmental concerns. Post liberalisation has also seen stark inequalities only rising over the years where accumulation of capital and natural resources is in the hands of a few rich citizens and the poor's conditions have been further deteriorate with a loss of livelihoods due to displacement because of so called 'development projects', deforestation and climate change. The growth policies which the government have given primacy to lift the poverty levels have ironically widened the inequality gap between rich and poor. This has been evident with how badly the pandemic affected

³ <https://www.cprgindia.org/pdf/CPRG-Newsletter-Sep-2021.pdf>

the poor, while the rich continued to prosper even more. There is a desperate need to take into account the marginalised communities into the benefits of growth, this can only be done if the government takes into account the equity factor in formalisation economic policies for an equitable and egalitarian growth while factoring in sustainability and biodiversity.

Coming back to the development discourse of the state, Uttarakhand, the need to strike a balance between growth and environment lies in the fact that the glaciers are the source of three large river basins – Indus in the west, Ganga in the central part and Brahmaputra in the east, which together are home for 600 million people. This has been recognised and underlined at the international level as well as the national level in India. Para 1 of Agenda 21 titled "**Managing Fragile Ecosystems: Sustainable Mountain Development**", adopted at the UN Conference on Environment and Development, 1992 refers to the special need for sustainable mountain development, with the mountains being recognised as a fragile ecosystem.

The fragility of the ecosystem came into limelight post 2013 flash floods. According to a report of National Institute of Disaster Management, Roads, the construction of bridges, buildings, hotels and guest houses etc. were allowed on the flood-way of major Himalayan rivers in complete disregard of the fact that a major flood, not unknown in the high and mid-Himalayas, would cause heavy destruction. The muck and debris disposed during the construction in the rivers also raised the levels of the river bed adding to the threat of floods. These types of disasters can be attributed to thoughtless and excessive interference, under the influence of short-term economic gain, with the environment by the government.

The construction of hydropower plants has also not helped the situation. It would be mistaken to consider it environmentally or socially benign. From an environmental perspective, hydropower projects, especially the larger ones, entail considerable civil construction works. Tunnels, often quite long, are also bored through the mountains to carry water to the turbines from the reservoirs created by dams and barrages. They also need to be provided with good roads that are sufficiently wide without too steep a gradient and sharp turns in order to facilitate movement of heavy construction and machinery and power turbines. All this construction, much of which makes use of explosives to blast hills to build or widen roads, create space for civil works and build tunnels, causes considerable disturbance to the fragile Himalayas.

The Himalayas, is still a young and active mountain range that is still colliding against the Eurasian plate. Disturbances generated in the course of construction are triggers for destabilisation of the hills and landslides, even with moderate rainfall. The muck from construction is disposed of by rolling down hillsides. It ultimately finds its way into streams and rivers raising their bed, which becomes a cause for floods.⁴

⁴ <https://www.cprgindia.org/pdf/CPRG-Newsletter-Sep-2021.pdf>

Though the state has been performing relatively well economically. There are vast inequalities between the lowlands and the districts placed higher in the mountainous regions. The concentration of industrial activity is in the lowlands giving impetus to migration to these areas, while increasing the vulnerabilities of the ones left behind in the mountainous districts. The need like the entire nation is to lessen the gap and make a more inclusive policy towards development of these areas as well.

Illegal constructions have also added to the woes of the ill-planned government policies. Its own Vidhan Sabha, Doon University and a residential colony have been built on the Rispana river bed in Dehradun. In small towns where space is sometimes even more limited, hotels and shops are often illegally constructed in the middle of stream beds. A large scale river bed sand mining has increased the flow velocity and erosion of river banks with a negative consequence on the river ecosystem, has also been expressed by a study done by Wildlife Institute of India.

The mismanagement of the governance and communication in response to both the 2013 and 2021 disasters are well known and an urgent need for proper functioning of the state disaster management apparatus is the need of the hour.

1.2 Uttarakhand and Tourism

Uttarakhand has been facing unemployment, out-migration and threats from unsustainable tourism practices. In Uttarakhand, tourism has been recognised as an important component for its development. Nature-based tourism is one of the core components of tourism in the state. In this regard, Ecotourism is considered to be the most appropriate model for it. The Ecotourism Development Corporation Uttarakhand (ETDC) was established in March 2017, after 17 years of formation of the state, however this is an important initiative to promote sustainable tourism practices. Ecotourism with the rising unemployment and the ecological concerns faced by the state fits aptly to create an alternative mode of employment. There are various ways to define ecotourism but in one of the definitions to comprehensively capture the essence of ecotourism is by Honey who defines Ecotourism as:

Ecotourism is travel to fragile, pristine and usually protected areas that strives to be low impact and (often) small scale. It helps to educate the traveller, provides funds for conservation, directly benefits the economic development and political empowerment of the local communities and fosters respect for local cultures and human rights.

Institutionalising ecotourism through ETDC brings forward scope of local regional development and meeting the conservation needs of the state if it is carried out in accordance with certain principles and ethical bases in tourism practices. According to Fletcher (2014) just using the term “ecotourism” is not a guarantee of sustainability. The rise of the private sector in tourism in the past few decades is a pertinent threat to the imperatives established in ecotourism.

Chapter 2 – Tourism & Waste

2.1 Present Context The sustenance of Himalayan ecology and ecosystems is an important priority if we just look at the resources the Indian Himalayan Region provides. Nationally, the need for sustenance needs to be recognised as the Himalayan ecosystem have relevance and linkages with downstream economies, poverty in the region, outmigration, susceptibility to disasters, climate risks and their repercussions. There is a dire need for consideration of dimensions such as eco-friendly development, payment / compensation for services, hazard or climate-proof developmental planning, enforcement of municipal codes, carrying capacity, awareness and participation of people, incentives and stakes, and development of guidelines and best practices to emulate.

Looking at the positive initiatives the government has taken in implementation of this pertinent needs are India's National Environment Policy (NEP) in 2006, National Action Plan on Climate Change (NAPCC) envisaged a dedicated mission for Himalaya known as "National Mission for Sustaining the Himalayan Ecosystem (NMSHE)". The Government of India has also initiated a National Mission on Himalayan Studies (NMHS) to conduct a focused study in IHR.

Tourism, which is an important aspect when it comes to sustainable development in IHR. The Draft Policy for Sustainable tourism in June 2021, needs to be elaborated. The document defines tourism as Tourism is an activity where the consumer (tourist) travels to the producer and the product, which leads to a special relationship between consumers (visitors), the industry, the environment and local communities. Tourism, as a service industry that is based on delivering an experience of new places, means that it involves a considerable amount of interaction, both direct and indirect, between visitors, host communities and their local environments. Tourism makes people (visitors and hosts) become far more conscious of environmental issues and differences between nations and cultures. This can affect attitudes and concerns for sustainability issues not only while travelling but throughout people's lives. Tourism, in the document, has been defined as a double-edged sword for sustainability, where it can go either way negatively affecting the ecosystems and hence, the economy or can lead to sustainable development. The draft proposes sustainable tourism as an alternative to sustainably manage the rising tourism without sacrificing investment and employments in this sector.

With the increased dialogue about climate change at the global level, the impact tourism sector is having on global warming has come into the limelight. According to the United Nations World Tourism Organization (UNWTO), tourism contributes to about 5% of global carbon dioxide emissions and 4.6% of global warming by radioactive forcing. The transport accounts for 75% of the total CO₂ emissions by the sector, with aviation and road transport accounting for 40% and 32% respectively and the accommodation stands at 21% of the total tourism sector emissions. Sustainable tourism also extends to sustainable tourist practices, though slow but hopefully in the coming years with this

aspect would be covered in the policies formulated by the union governments and the state governments, in particular. Globally, policy initiatives to promote sustainable tourism have been introduced providing an adaptive framework that is flexible to be adopted by both developed and developing countries. An evolution of institutional mechanisms and an attitudinal shift has been noticed in Sustainable Tourism from the first UN Earth Summit 'Rio 92' to the third Earth Summit (United Nations Conference on Sustainable Development) 'Rio +20' held in 2012. Establishment of the Global Sustainable Tourism Council (GSTC) has been a key development to promote sustainable tourism globally. It provides and manages the global sustainable standards, known as the GSTC Criteria. There are two dimensions to this: 1. Destination Criteria for public policy-makers and destination managers, and 2. Industry Criteria for hotels and tour operators. When it comes to India and how well it performs in sustainable tourism, the draft explicitly mentions where it stands. Quoting the document "In India tourism has grown consistently to reach 13th rank in the world in terms of International Tourism Receipts and 22nd rank in terms of International Tourist Arrivals as per UNWTO data for year 2019. India has improved its overall rank to 34th position in World Travel and Tourism Competitiveness Rank in 2019, but its rank under Environment Sustainability has been 139, 134 and 128 in 2015, 2017 and 2019 respectively. It shows India's poor track record in sustainable tourism. India has also ranked poorly in adventure tourism securing 96th position in the Adventure Tourism Development Index 2020, which is much lower than its neighbours Bhutan, and Nepal. India is also not a preferred destination for nature tourism."

Relevance of Sustainable tourism in the Indian context:

The importance of sustainable tourism as part of sustainable development as a whole has been recognised by the government. The Ministry of Tourism has time and again propagated the vast potential of sustainable tourism in being the driver for sustainable livelihoods, especially in high population districts. The brand of 'Incredible India' has been used to attract tourists, not only to major cities and heritage attractions, but also to rural India where through correctly aligned policy mechanisms, the problems of disguised unemployment in agriculture as well as migration to urban areas can be mitigated through community-based tourism models mentored by the industry. Given the fragility of the ecosystems especially in the IHR, balance between visitor numbers and heritage conservation has been taken into account, the Ministry of Tourism has been working towards providing policy mechanisms to guide the industry towards sustainable use of resources and mitigating negative impacts on environment and society. Some of the initiatives as envisaged by the document are:

- A National Workshop on Sustainable Tourism Criteria for India was convened in July 2010. Based on the recommendations of this National Workshop on Sustainable Tourism Criteria for India, a sub-committee chaired by the Joint Secretary (Tourism), Government of India, and comprising expert stakeholders was constituted in 2010 for defining Sustainable Tourism Criteria for India (STCI) and Indicators. The Ministry of Tourism has since launched the

Sustainable Tourism Criteria for India (STCI) with an aim to promote and ensure environmentally responsible and sustainable practices in the tourism industry.

| Sustainable Tourism Indicators | IHR Policy Areas of Assessment |
|---|--|
| Wellbeing of host communities | <ul style="list-style-type: none"> • Tourism Enterprise Development Governance • Gender |
| Sustaining cultural assets | <ul style="list-style-type: none"> • Quality Standard/Control Mechanism |
| Community participation in tourism | <ul style="list-style-type: none"> • Tourism Enterprise Development Governance • Gender |
| Tourist satisfaction | <ul style="list-style-type: none"> • Quality Standard/Control Mechanism |
| Health and safety | <ul style="list-style-type: none"> • Pollution Control • Crisis Management |
| Capturing economic benefits from tourism | <ul style="list-style-type: none"> • Tourism Enterprise Development Governance |
| Protection of valuable natural assets | <ul style="list-style-type: none"> • Quality Standard/Control Mechanism |
| Managing scarce natural resources | <ul style="list-style-type: none"> • Natural Resource and Ecology Management |
| Limiting impacts of tourism activities | <ul style="list-style-type: none"> • Waste Management • Pollution Control |
| Controlling tourist activities and levels | <ul style="list-style-type: none"> • Tourist Traffic Management and Visitor Control |
| Destination planning and control | <ul style="list-style-type: none"> • Disaster Management • Pollution Control • Visitor Control • Tourist Traffic Management • Crisis Management • Waste Management • Natural Resources and Ecology Management • Quality Standard/Control Mechanism • Energy |
| Designing products and services | <ul style="list-style-type: none"> • Marketing and Branding |
| Sustainability of tourism operations and services | <ul style="list-style-type: none"> • Quality Standard/Control Mechanism |

Source: Niti Aayog 2018

- Further, the Ministry has also formulated guidelines for classification of hotels under various categories, which require hotels to incorporate various eco-friendly measures like Sewage Treatment Plant (STP), Rain Water Harvesting System, waste management system, pollution control, introduction of non-Chlorofluorocarbon (CFC) equipment for refrigeration and air conditioning, measures for energy and water conservation etc. The Ministry has also prescribed that the architecture of the hotel buildings in hilly and ecologically fragile areas should be sustainable and energy efficient and as far as possible be in conformity with the local ethos and make use of local designs and material.
- The tour operators approved by Ministry of Tourism have to sign a pledge for commitment towards Safe & Honourable Tourism and Sustainable Tourism to fully implement Sustainable Tourism practices, consistent with the best environment and heritage protection standards.

- Many State Governments have taken laudable initiatives to promote sustainable and responsible tourism including rural tourism, agro tourism, adventure tourism, ecotourism, homestays, sustainable livelihoods. Industry has also been taking voluntary steps to become more sustainable particularly in use of energy, sourcing of material and adopting eco- friendly measures.

While these measures do show an attitude and will to shift the focus on sustainable tourism, the implementation by state governments in this regard have not been up to the mark. There is a need to introduce a mechanism for accountability and grievance redressal. Responsibility at the hands of the stakeholders associated with this sector becomes an important factor for the successful implementation of the strategy.

| S N | Sustainable Tourism Indicator Areas | AS | AR | HP | JK | MN | ML | MZ | NL | SK | TR | UK | WB |
|-----|---|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Wellbeing of host communities | | | | | | | | | | | | |
| 2 | Sustaining cultural assets | | | | | | | | | | | | |
| 3 | Community participation in tourism | | | | | | | | | | | | |
| 4 | Tourist satisfaction | | | | | | | | | | | | |
| 5 | Health and safety | | | | | | | | | | | | |
| 6 | Capturing economic benefits from tourism | | | | | | | | | | | | |
| 7 | Protection of valuable natural assets | | | | | | | | | | | | |
| 8 | Managing scarce natural resources | | | | | | | | | | | | |
| 9 | Limiting impacts of tourism activities | | | | | | | | | | | | |
| 10 | Controlling tourist activities and levels | | | | | | | | | | | | |
| 11 | Destination planning and control | | | | | | | | | | | | |
| 12 | Designing products and services | | | | | | | | | | | | |
| 13 | Sustainability of tourism operations and services | | | | | | | | | | | | |

Source: United Nations World Tourism Organizations (2004) Abbreviations: AS-Assam, AR-Arunachal Pradesh, HP-Himachal Pradesh, JK-Jammu & Kashmir, MN-Manipur, ML-Meghalaya, MZ-Mizoram, NL-Nagaland, SK-Sikkim, TR-Tripura, UK-Uttarakhand and WB-West Bengal

Closely assessing the IHR when it comes to tourism, there are many instances of commercialisation of areas which are surrounded with thick forests along with rich biodiversity. This often leads to inadequate facilities when it comes to transport, accommodation, waste disposal etc. catering to the growing number of tourists. A lack of regulatory mechanism for infrastructure creation, management, and for controlling the tourist inflow in such sites which invariably effects the sensitive ecosystems and cultural resources of these areas are facing pressures far beyond their carrying capacities. Therefore, there is an urgent need to develop and implement guidelines based on the concept of their carrying capacity, for growth of sustainable pilgrimage and commercial tourism in the region.

2.2 Ecotourism In this regard, the Draft Strategy for sustainable tourism propagates the concept of eco-tourism. India

despite amassing one of the richest biodiversity in the world with a natural advantage of rich resources, ranks among the lowest in global ecotourism development rankings. There is an urgent need to adopt a model within the principles of ecotourism which would help in conservation of our natural wealth, along with generating economic benefits, to the maximum extent possible especially for the local communities. This should be adopted while keeping its adverse impacts to the minimum. This was recognised by the then, Ministry of Forest and Environment in the year 2011 which issued guidelines for the promotion of ecotourism especially in the protected areas.

Globally, ecotourism has been recognised as an alternative tool for forest conservation and also biodiversity and wildlife protection. This is done so, by creation of sustainable alternative livelihoods and by generation of mass awareness about conservation. Ecotourism potentially would be one of the fastest growing components in the tourism sector. With the growing sentiment amongst the public about eco-friendly practices and nature-based recreation, ecotourism becomes a relevant aspect which would require adequate attention by the policy-makers. In the global context, ecotourism has a market of around 181 billion in 2019, this is projected to be 338.7 billion by 2027. The best ecotourism practices are followed in **Costa Rica, Norway, Kenya, Palau, Galapagos and Antarctica.**

2.3. Tourism and Sustainable goals

Tourism is included as targets in Goals 8, 12 and 14 on inclusive and sustainable economic growth, sustainable consumption and production (SCP) and the sustainable use of oceans and marine resources, respectively. Tourism, however, has the potential to contribute, directly or indirectly, and has cross-linkages to all of the sustainable development goals.

2.4 Adventure Tourism

Within sustainable tourism, adventure tourism promotes a source of employment for the locals all year round. It incorporates and promotes core values of responsible tourism i.e. respect for cultural and natural assets and protection of the most vulnerable. It helps in highlighting the natural and cultural values of a destination, thereby promoting its preservation, and creates resilient and committed travellers. Adventure tourism is resilient, attracts high value customers and supports local economies. Why do adventure tourism stakeholders encourage sustainable tourism? It is due to the fact that without a pristine natural environment and meaningful cultural experiences, adventure tourism would not exist. Adventure Tourism provides a platform for new destinations to market themselves as truly unique, appealing to those travellers looking for rare, incomparable experiences.

As per industrial guesstimates, adventure tourism in India is growing by 20-25 per cent. According to Nielsen, India attracted just over 3.4 m adventure tourist visits in 2015. The revenue generated from

domestic adventure tourist visits to India amounted to around US\$ 190 mn in 2015, according to Nielsen, while foreign adventure tourist visits to India generated about US\$ 70 mn.

With the growing economic relevance of adventure tourism, the challenges remain persistent which creates a barrier to fully realise the potential this sector has to offer. Lack of infrastructural facilities, training, not only the risk aspect goes ignored but even the waste generated has no mechanism for accountability.

2.5 Steps taken by the government in handling waste generated by tourism

| IHR States | Population (2011 Census) (% of population of India) | MSW Status MT/day (2009-2012) | Solid Waste Generation Per Capita (gm/capita/day) |
|-------------------|--|----------------------------------|--|
| Arunachal Pradesh | 1,382,611 (0.11%) | 93.802 | 0.06 |
| Assam | 31,169,272 (2.58%) | 1,146.28 | 0.03 |
| Himachal Pradesh | 6,864,602 (0.57%) | 304.3 | 0.04 |
| Jammu & Kashmir | 12,548,926 (1.04%) | 1792 | 0.14 |
| Manipur | 2,721,756 (0.22%) | 112.9 | 0.04 |
| Meghalaya | 2,964,007 (0.24%) | 284.6 | 0.09 |
| Mizoram | 1,091,014 (0.09%) | 4742 | 4.34 |
| Nagaland | 1,980,602 (0.16%) | 187.6 | 0.09 |
| Sikkim | 607,688 (0.05%) | 40 | 0.06 |
| Tripura | 3,671,032 (0.30%) | 360 | 0.09 |
| Uttarakhand | 10,116,752 (0.84%) | 752 | 0.07 |
| West Bengal | 91,347,736 (7.55%) | 12,557 | 0.13 |

Source: ENVIS

Source: Niti Aayog 2018

With the rising tourism, the waste generated especially in the past few decades in the IHR has been manifold. These developments have direct or indirect causes and effects such as pollution, overexploitation of natural resources, food insecurity, ill planned urbanization, traffic congestion, loss of indigenous culture, natural disasters, and so on. As per the available data (2009-2012) IHR states are accumulating 22,372 metric tonnes (MT) of municipal solid waste per day. Without the proper implementation of the existing mechanisms for solid waste disposal, the waste ends up being dumped in open landscapes and often in the forests which have far implications on the health and ecology in the area. Waste generation and waste disposal thus with the gamut of sustainable tourism becomes of relevance.

For effective management of solid waste, many attempts have been made so far under government of India enacted rules and guidelines such as the National Green Tribunal, 2009, the Municipal Solid Waste Management and Handling Rules-2000, Hazardous Waste Management and Handling Rules-

2000, Plastic Waste Management and Handling Rules-2011, E-Waste Management and Handling Rules-2011, JNNURM SWM Toolkit 2012, and through state/ local level legislations such as - solid waste management in Shimla (HP), banning the use of plastic in some states (Himachal Pradesh, Uttarakhand, Sikkim, Tripura), the Door-to-Door Garbage Collection Bye Laws (MC Shimla)- 2006 and the Uttarakhand Plastic and other Non-Biodegradable Garbage (Regulation of Use and Disposal) Act - 2013, etc.

For the sustainable management of solid waste, some important local practices such as the Door-to-Door (D2D) garbage collection schemes in cities like Shimla, Dehradun and Agartala have also been implemented. This demonstrates the zero tolerance of the IHR states towards pollution caused by plastic in the region. Realising the growing concern over e-waste, the government has also supported several initiatives. The guidelines for e-waste collection, transportation, recycling and disposal were issued in March 2008-11 by the MoEF&CC and the CPCB, which came into effect from 1st May, 2012. Waste-to-Energy (WtE) initiative is actively promoted by the Ministry of New and Renewable Energy (MNRE). There is a potential of about 1700 MW energy from urban waste (1500 from MSW and 225 MW from sewage) and about 1300 MW from industrial waste. Waste-to-Energy provides a solution towards complying with government regulations, and achieving integrated solid waste management.

The formulation of the SWM rules 2016 and PWM 2016 defined the responsibilities of various stakeholders such as state governments, local bodies, street vendors and made the producers responsible for the waste generated by bringing the concept of extended producer responsibility which would ensure environmentally sound management of post-consumer products.

The responsibilities of the producers are as follows:

- Manufacturers and Brand Owners using disposable products such as tin, glass, plastics packaging, etc., have to provide necessary financial assistance to local authorities for establishment of waste management system.
- Brand owners using non-biodegradable packaging material should put in place a system to collect back packaging waste generated due to their production.
- Producers of Sanitary Napkins and Diapers should explore the possibilities of using all recyclable material or provide pouch for disposal.

EXTENDED PRODUCERS RESPONSIBILITY



Such legislations do show an initiative to tackle waste generated, however there are many loopholes which give opportunities to various stakeholders to evade the existing legislation. Last Mile delivery becomes a factor which needs attention for successful delivery of such legislations. Accountability needs to be fined for future course of action.

Chapter 3 – Case Studies

It is important to mention here that tourism is an important sector which cannot be ignored for the overall growth of Uttarakhand. The vast potential, no doubt has been recognised and is yielding in profitable local businesses but at what cost? Is the wealth generated the only criteria to assess how progressive a state is? Can it be possible to adopt a more sustainable model for development so that the future generations could also take advantage of the resources available?

It is here that the best practices where this challenge has been successfully overcome should be carefully looked at and perhaps it can help us adopt similar practices in Uttarakhand. We do not have to go very far, there are many places within India which have successfully overcome this problem and are generating profits as well.

3.1. Roing - Arunachal Pradesh

Roing a district capital in Arunachal Pradesh has successfully overcome this challenge and has no instances of littering. Roing is located in The Lower Dibang Valley and is host to the highest rates of biodiversity in the IHR. Roughly 80% of the area comprises dense forests.



Source: <https://wasteaid.org/solid-waste-management-small-himalayan-town-india/>

Over the past few decades growing population has led to massive urbanization. One of the challenges that growing urbanisation faces is the question of managing the waste generated. Analysts and specialists who studied this area carefully found that the synchrony between the government and the local population was unique and led to the area successfully managing waste. Now, looking at the local population first, it was surprising to find that there wasn't a word for "waste" in their local dialect because their lifestyle itself was sustainable. Now going to the government, the urban

development board has set up a basic collection system and a dumpsite in the outskirts. Also, an incinerator and a small composting machine was set up.⁵ The waste analysis study found that the waste generated was significantly lower than the rest of the country. The organic waste in percentage terms was over 36 %, which is lower than the national average of 55%. The reason behind this was the efficient cooking habits and the food waste being fed to the pigs reared in their houses. Over 5.6 tons of MSW was generated in Roing, the organics from household and market areas could produce compost worth 4000 INR on a daily basis. It was found in the study that locals were mostly unaware about the ill-effects of improper disposal of waste on health, pollution to water and land. But were eager to correct their practices of waste disposal, the shopkeepers readily agreed to phase out disposables and plastics. The government officials themselves were very committed to keep Roing eco-friendly and maintain effective waste management in the future as well. The analysis found a refreshing take by the locals on the waste management and the enthusiasm they had for the protection of their forests and rivers is what sets Roing apart. It is a classic example of how political will along with an informed population can successfully mitigate any challenge.

3.2. The State of Sikkim

Now looking at a state which has successfully tackled the issue of waste management has been Sikkim. Sikkim, popularly known for being the only organic state in India has since the beginning taken steps towards preserving the state's ecology. In 1997 itself , it banned disposable plastic bags. The step was taken in light of reports being published on how the discarded plastic bags choked drainage system and the streams, which resulted in water flows being diverted and causing a spate of landslides in and around Gangtok, Sikkim. Sikkim was also among the first to target single-use plastic bottles. In 2016, Sikkim banned the use and sale of disposables made from Styrofoam. It has also prohibited use of packaged drinking water in government functions.



Source: <http://www.feelindia.org/tag/lachung-package/>

⁵ <https://wasteaid.org/solid-waste-management-small-himalayan-town-india/>

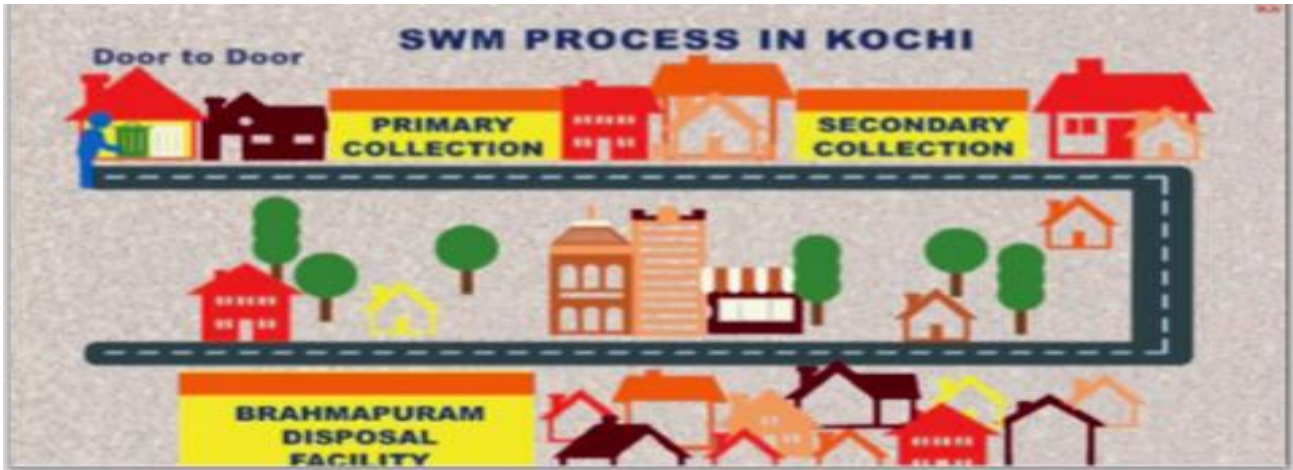
However due to the rise of tourism in the state, the government is facing immense pressure to process the waste disposed of, which becomes manifold during the peak season. The magnitude of the problem could be visualised from the fact that if all PET bottles from the annual waste in the state were laid together in a line, they would cover a distance four times the length of the Teesta river. The government being acutely aware of this problem is now pushing towards Zero Waste to overcome the problem of the waste generated due to rising population and growing tourism in the state.

For successful implementation of Zero Waste, it is hence necessary that grassroots innovations and monitoring are the core of policy implementation. The village Lachung in North Sikkim, is worth mentioning here which has successfully through grassroots democracy effectively managed waste disposal. Its unique system of self-governance is called the 'Dzumsa' and local disputes are settled by a representative body of the village headed by an elected 'Pipon'. The area has combined the concept of cleanliness with religion for waste management.

A pilot has been carried out where bamboo bottles for tourists were introduced, following a ban on use of plastic mineral water bottles imposed by the Dzumsa in the year 2017. In about three months the bamboo is treated to be produced to a bottle and then eventually reaches the customers. The bottles are being sold at Rs 200 and if they return after using, they will get a refund of Rs 180. The manufacturing cost of each bottle is roughly Rs 100. What is unique about such an initiative is community engagement at the grassroot level which is a necessity for the success of any policy introduced.

3.3. Kochi - Waste Segregation at Source Level

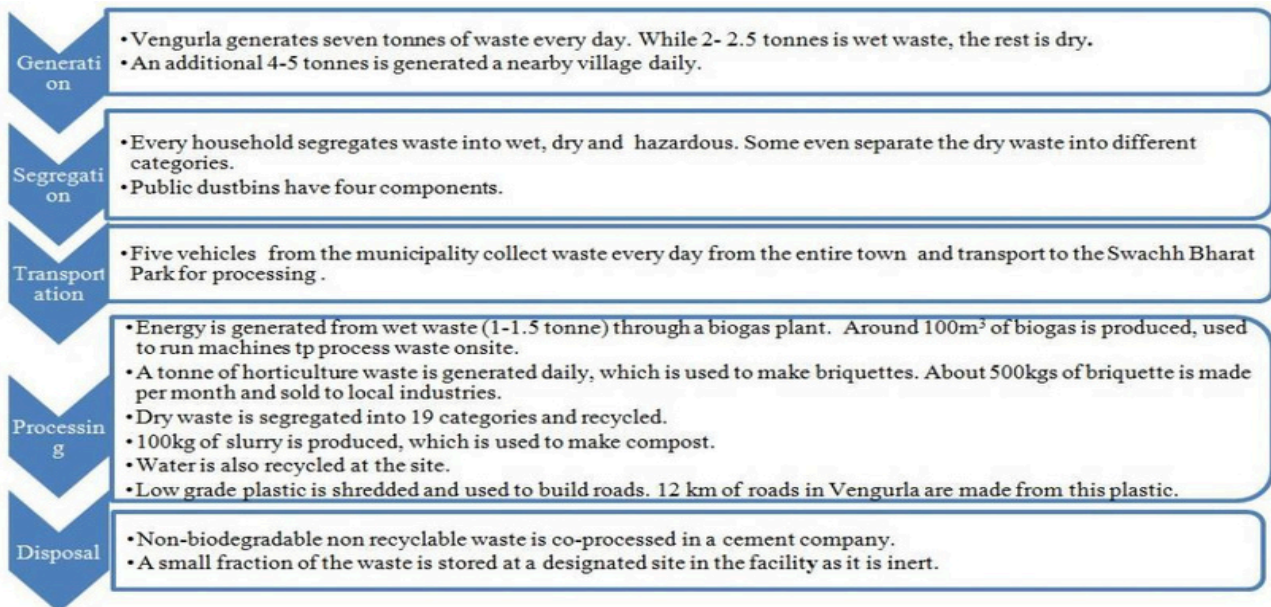
A decade ago, the waste crisis due to increasing pressure of tourism in the city of Kochi in Kerala grew manifold. This led to questioning the existing model of waste disposal which was leading to heaps of garbage in the form of landfills in the outskirts of the city. Kochi Municipal Corporation, in this regard, launched the Clean Keral Movement under which it took a pledge to effectively and sustainably manage waste. Dominant ways for the implementation of their vision were adopted where public awareness drives in localities, schools and media took place. The public participation and enthusiasm grew over time by witnessing such affirmative government action and led to them being more adaptable to change their current lifestyles of managing waste.



Source: <https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/2939>

Kochi is today a bin-less city where door to door collection of waste in each household is done. The government, in this regard, has partnered with SHGs and private firms through which ward level sanitation drives take place regularly. A special mention here would be relevant of the work Kudambamshree has done to aid the government in efficiently managing waste, where the NGO has taken the opportunity to provide hundreds of women employments where they work as workers under the organisation for collection of waste. A redressal system is also in place for both the workers and the locals for grievance redressal. The successful PPP model in Kochi and the public participation towards this initiative is the key driver for the model to be effectively implemented.

3.4. Vengurla, Maharashtra



Source: <https://www.downtoearth.org.in/news/waste/a-waste-management-model-for-small-towns-58771>

The above diagram comprehensively shows how Vengurla a district in Maharashtra has successfully managed waste through segregation at source level.

3.5. Key Takeaways; lessons Uttarakhand can take from Sikkim

All the best practices elucidated in this chapter highlight the commonalities all the cases had in order for it to be a success. Some of the commonalities between these models has been:

1. Affirmative action by the government
2. Public participation
3. Lifestyle changes adopted by the locals
4. An opportunity for alternative source of income

Sikkim as part of comparison with Uttarakhand there is no doubt, it by far has taken much more affirmative actions to be in the position that it is today. It is here that it becomes important to see why Sikkim has successfully overcome the challenges pertaining to waste due to the rising tourist population.

The Sikkim's government proactiveness has paid dividends in the transformation of Sikkim as one of the top most performing states when it comes to human development. Sikkim was the first state to formulate an eco-tourism policy with the help of the expertise Japanese and American companies. The state developed tourist destinations and popularized less developed areas, keeping in mind the consideration of the sensitive ecology of the Himalayan region by sustainably developing local infrastructure and tourist activities which did not pressure the carrying capacity of the region.⁶

The state modified central schemes such as the Indira Awas Yojana: for the development of villages and promotion of ecotourism. Adequate funds were allocated for sanitation facilities for the tourists. The Lonely Planet⁷ recognised the success of the sustainable-community based tourism model which has facilitated the developmental growth of the less-developed areas. Promotion of adventure tourism also has played a key role in the facilitation of economic growth and employment opportunities for the youth in the region. Some of the interesting collaborations that Sikkim has undertaken with international organisations include:

- The Department of Forests, Environment and Wildlife Management along with Japan International Cooperation Agency (JICA) has been implementing the Sikkim Biodiversity Conservation and Forest Management Project for the past decade. The objective of the project is to strengthen biodiversity conservation activities and forest management capacity,

⁶ Available at:

https://www.researchgate.net/publication/343385606_Rural_Tourism_in_Sikkim_An_Exploration_of_its_Potential_for_Inclusive_Growth

⁷ Available at:

https://www.researchgate.net/publication/343385606_Rural_Tourism_in_Sikkim_An_Exploration_of_its_Potential_for_Inclusive_Growth

and to improve indigenous livelihoods which are directly dependent on forests by promotion sustainable biodiversity conservation, afforestation and income generation activities including ecotourism for the community development, which would as a result contribute in the environmental conservation and socio-economic development of Sikkim.

- Home stay programmes in Sikkim promote ecotourism in rural areas and has been supported by UNESCO Paris, Norwegian Govt. & the Principality of Andorra & implemented by Ecotourism & Conservation Society of Sikkim (ECOSS).

The policy of ecotourism in Sikkim is in consonance with the conservation objectives. The policy states that there would be little construction and would be based on the absolute requirement, no felling of trees, and rigorous plantations would be the key driver for any specific or jointly managed ecotourism program. The impact assessment for every location would be conducted on an annual basis for corrective and improvement measures. It was the first state to be declared plastic free and the only state to be organic. Fines and repercussions of littering the state are a significant amount. The local people in the area have a deep consciousness embedded in their culture about the preservation of their surroundings. Environmental consciousness is embraced in the Buddhist values that worship and revere nature. The success of the affirmative policies introduced by the state government is clearly empirically visible where the water bodies are pristine and clear. No garbage and waste disposal seen. Occurrence of waste segregation and recycling on a regular basis. Vehicles beyond a point are not permitted as can be seen in the Gangtok city centre. Walkability of the area is adequate for tourists to prefer this mode to travel for short distances, which leaves a lower carbon footprint in the region.

The focus of tourism and state directives is formulated in a fashion which promotes nature parks and biodiversity parks. Moreover, the state government has recognised the importance of eco-tourism in helping the local population be less-dependent on forest resources for their livelihoods.

A SWOT analysis found that the key Strengths and Weakness were as follows: -

Strengths

1. Historical importance of Sikkim
2. Value for money accommodation infrastructure.
3. Buddhist Culture / ambience as a tourist attraction.
4. Eco / Adventure Tourism.

Weaknesses

Connectivity / poor basic infrastructure like roads, expensive travel costs due to absence of public / private transport system.

A similar initiative by the government by conducting an in-depth analysis on the strengths and weaknesses when it comes to promotion of sustainable tourism for Uttarakhand would help to identify key weaknesses which would further be addressed through affirmative actions taken by the government and the civil society.

Chapter 4 – Different Models on Managing Waste

Waste Management without doubt incurs a significant financial cost. According to United Nations, most municipalities in Asia utilised more than 70% of the expenditure on waste management. The richest cities in Malaysia such as Kuala Lumpur and Subang Jaya spend 40-70% of their expenditure on waste management. Subsequently, cities with lower financial capacity provide only unsatisfactory waste management services. For example, in Nepal, the withdrawal of foreign waste management led to the collapse of the waste management due to insufficient funds available for efficient waste management. Recognition to proper waste disposal is the first step the government needs to take and also needs to prioritize waste management for the overall development of the cities in the IHR and Uttarakhand, specifically.

Some of the effective waste management strategies as elucidated by a report prepared by the United Nations are:

1. Appropriate formulation of policy after assessing the context of the specified place.
2. Recognising appropriate factors such as political, economy and environment which would drive towards a sustainable management system.
3. Constant impetus for improvement of existing technologies so that the innovative technologies can reduce the expenditure allocated by the government towards waste management.
4. A proper legal framework needs to be implemented with appropriate scope for checks and balances.
5. Specific legislative targets need to be formulated
6. Appropriate strategies need to be implemented for community awareness programmes for better community engagement
7. Regional cooperation with neighbouring states and countries
8. Turning wastes into valuable products which can act as an alternate source of income as well as generate employment for the locals.
9. For effective implementation of the policies PPP model should be adopted which would provide expertise in evaluation of the policies and aid in capacity development.
10. Community based waste management and zero waste community are two strategies which could promote greater community participation.

4.1 Zero Waste In response to the challenge of achieving sustainability a movement called zero waste lifestyle is in vogue. Zero-waste is the process of eliminating all trash, especially single use plastic, from everyday life.



Source: https://www.researchgate.net/figure/A-holistic-zero-waste-city-model-with-five-inter-connected-key-principles-that-need-to_fig2_257409801

The Zero Waste International Alliance (ZWIA) has defined zero waste as:

“The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.”

The primary goal of zero waste is to push economies towards the target of sending no waste to landfill, incinerators, and the ocean. While conscious waste management practices and recycling do remain at the core of the zero-waste approach, it goes beyond and closely looks into the entire lifecycle of a product highlighting inefficiencies and unsustainable production and consumption practices. Zero waste does not only refer to minimising waste, but also pushes the economy to be less wasteful in production and consumption. Zero waste is questioned on whether it is too idealistic in its philosophy, but it must be emphasised that zero waste are actually guiding principles whose primary objective is towards eliminating waste at any and all stages of the chain. The goal is to ensure that the resources remain in use for a longer duration before returning to the earth with miniscule environmental impact. The zero waste principles include obligations targeting three main stakeholders of the society:



Source: <https://www.zerowaste.com/blog/what-is-zero-waste-a-guide-to-resource-recovery-and-conservation/>

The principles include:

- Design closed-loop systems
- Ensure processes (manufacturing, recycling, etc.) happen close to the source
- Conserve energy
- Don't export harmful waste
- Engage the community and promote change
- Keep products and materials in the loop as long as possible
- Build systems that provide feedback for continuous improvement
- Support local economies
- Promote materials as resources
- Minimize polluting discharges to land, water, and air
- Consider the true costs of opportunities
- Promote the Precautionary Principle
- Promote the Polluter Pays Principle
- Develop adaptable, flexible, and resilient systems
-

The Zero Waste hierarchy principles are:

Rethink, Reduce, Reuse, Recycle, Material recovery, Residual Management and Unacceptable.

These principles in sum, promote the cradle to cradle concept, i.e., a circular model that minimizes waste and keeps resources in use for as long as possible. It is considered a “closed-loop” that promotes sustainability and strives for zero waste through reduction, reuse, and recycling.

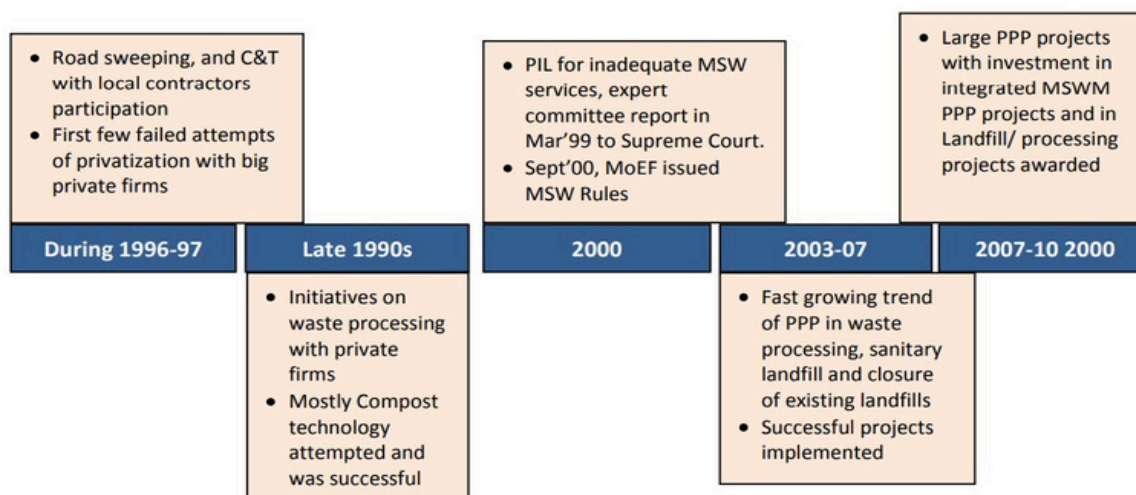
4.2 PPP Partnerships

The private sector's engagement in solid waste management has been increasing ever since the 1990s. In the late 1990s, urban local bodies (ULBs) realised the importance of processing waste for reducing the dependency on landfills. The inception of the MSW Rules (Management & Handling) 2000, made processing solid waste and developing sanitary landfills an imperative. This led to the surge of ULB initiatives for establishing processing facilities and engineered sanitary landfills (GOI-ADB-PPP Initiative). The private sector participation drove the implementation as technical, financial and managerial constraints at ULBs were well-established. Increased involvement of private players in the mid-2000 was largely a success in implementation of public private participation (PPP) projects in the ambit of waste processing, sanitary landfill and closure of existing dumpsites (GOI-ADB-PPP Initiative).

| S. No | Scope of services | PPP Format |
|-------|---|--|
| 1 | Door-to-door Collection | Service/Management contracts |
| 2 | Street Sweeping | Service contracts |
| 3 | Construction & Maintenance of Community Bins | BOT and its variance and/or Separate EPC and O&M Contract |
| 4 | Transportation of Waste to integrated processing & disposal facility | Concession and/or O&M Contract |
| 5 | Design, development, operations & maintenance of processing and treatment facility for MSW including special waste like vegetable market and/or abattoir waste. | BOT and its variance and/or Separate EPC and O&M Contract |
| 6 | Design, development, operations & maintenance of sanitary landfill site. | BOT and its variance and/or DFBOT and/or Separate EPC and O&M Contract |

Source: <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>

A few cities which have successfully adopted this model include Delhi, Hyderabad, Guwahati, Coimbatore, Bangalore, Chennai, Kolkata and Ahmedabad.



Source: <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>

The recognition of the need for Private Sector Participation was done as early as 1999 by a committee appointed by the Supreme Court to look into this matter:⁸

There is a need to improve accountability and the level of service through NGO, private sector participation in SWM services to improve overall performance. Private sector participation or Public Private Partnership may be considered by Urban Local Bodies in the areas where municipal corporations or municipalities are not currently providing a service keeping in mind the provisions of the Contract Labour (Regulation & Abolition) Act 1970 of Government of India. PSP may be considered in newly developed areas, underdeveloped areas and particularly in areas where local bodies have not been providing services. It should be encouraged in the areas of door-to-door collection of domestic waste, commercial waste, hospital waste, hotel waste, construction waste, yard waste and for setting up and operating / maintaining compost plants and other treatment plants as well as common disposal facilities. They could also be engaged for supplying vehicles on rent, lease as well as for repair and maintenance of vehicles. There should be a right mix of private sector and public sector participation to ensure that there is no exploitation of labour as well as that of the management. This will check growth in establishment cost, bring economy in expenditure and introduce an element of healthy competition between the private sector and public sector in Solid Waste Management.

There are several advantages and disadvantages which need to be taken into account whilst involving the private sector. This is determined in the manner the tasks and services are contracted out and whilst determining the daily operational procedures of collaboration between the public and private sector. PPPs overall provide ULBs with the following advantages, besides the potential improvements in delivery of service and external investment being brought in:

- **Flexibility:** Improvement of flexibility in the system is brought as the private sector is generally more flexible to hire qualified staff members and pay the salaries those experts' demands, and ensure that it is in line with performance & productivity. This results in a much faster decision-making process bringing in more efficiency and coordination.
- **Managerial and technical know-how:** Private participation aids in competence and expertise which may be lacking in the ULB. They bring in access to technology and financial resources for new investments. A PPP arrangement provides ULBs to achieve service delivery faster with the means of complementary private sector competencies.
- **Contestability and Operational accountability:** Identification of a private operator through bidding and allocated accountability for service performance helps ULBs bring in services in a

⁸ <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>

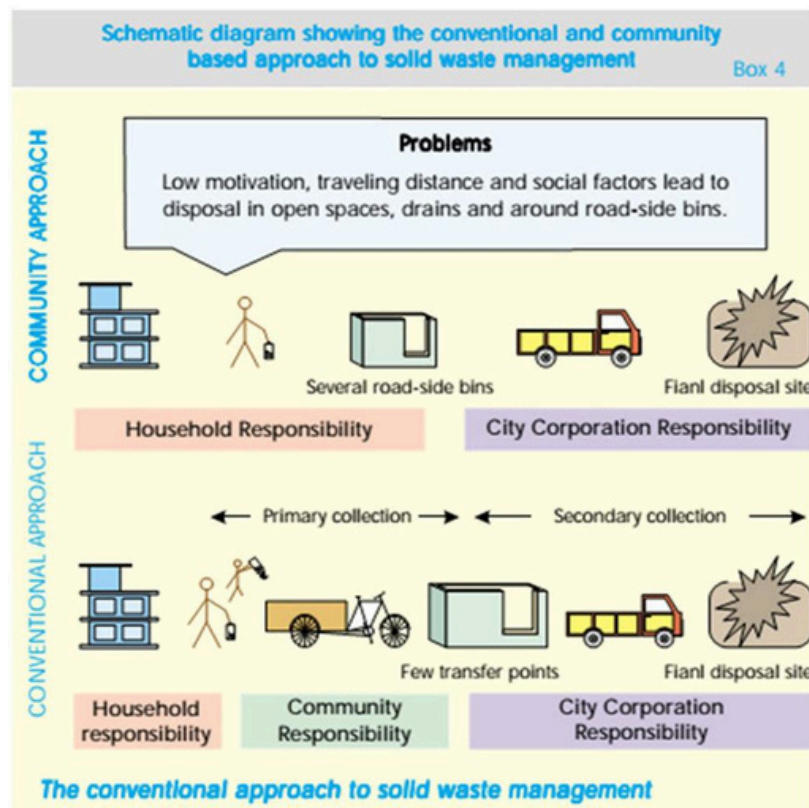
cost-effective manner and create incentives for good performance & service delivery, and thus reducing the already burdened ULBs from waste management.⁹



Source: <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>

⁹ <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>

4.3 Community Based Waste Management Strategy



Source: https://www.researchgate.net/figure/Community-based-approach-to-solid-waste-management-Field-note-12_fig3_312514488

Community-based waste management programs are essentially collaborations between the civil society, the government and the affected communities, to provide the equipment, resources and training necessary to establish an effective waste management program, and to run the program independently. It is accepted across all spheres that the middle- and low-income countries struggle quite significantly in adopting sustainable waste management frameworks due to constraints in financial resources and expertise.

Community-based waste management programs provides the citizens in middle- and low-income countries with a low-cost, effective and engaging waste management system. These systems advocate:

- Direct community-member engagement and accountability
- Tracking of waste collection and reduction
- Segregation of waste at the household level
- On-site utilization of valuable and reusable items
- Composting of organic waste
- Collection and transportation of waste to a treatment site by a public collection service.

Some of the guidelines in successfully implementing such a system has been comprehensively elucidated in a tool kit prepared by WasteAid titled Making Waste Work¹⁰. These guidelines have been picked up from the toolkit to give an overview of the essentials required for successful implementation of the system:

| A | | Be informed: Community waste management essentials | |
|--|--|---|--|
| <p style="text-align: center;">The challenge</p> <p>Some two billion people around the world, mostly in low income countries, do not have their waste collected. With no option other than to dump or burn waste, communities become unhealthy and hazardous places to live.</p> <p>Dumping and burning waste damages people’s health, and is especially harmful for children. If livestock eat waste they can become ill and even die.</p> <p>Waste blocks drains and leads to flooding, while burning waste releases smoke that is harmful to health and contributes to climate change.</p> <p>The amount of waste accumulating on land and in the oceans is now a global crisis, with waste polluting even the remotest parts of our planet.</p> | <p style="text-align: center;">The opportunity</p> <p>Fortunately, managing waste properly does not need to be expensive or complicated.</p> <p>Communities in lower-income countries where there is no waste service can still reduce the amount of waste they generate, and separate materials such as food waste and plastics.</p> <p>When waste materials are kept separate, they can be turned into new, useful products for local markets. With simple tools and the right knowledge, people can become self-employed recycling entrepreneurs, providing a very valuable service for the health and wellbeing of their community, and the whole planet.</p> | | |
| B | | Be prepared: Planning a community waste project | |
| <p style="text-align: center;">Know the materials</p> <p>Understand the common materials in waste, the problems they can cause, and the opportunities they present. Analyse the waste that is locally available and identify which materials to work with. Explore whether it is best to sell to an existing recycling market or convert waste materials into new products.</p> | <p style="text-align: center;">Choosing the right recycling project</p> <p>Selling materials to an existing recycling market can be the quickest and easiest approach. Markets don’t exist everywhere however, so making your own recycled products is the next best step.</p> <p>Make sure you have regular access to the materials and choose the most appropriate technology.</p> | | |
| <p style="text-align: center;">Develop a business plan</p> <p>Test whether there will be a market for your product locally. Calculate the cost of making your product, including collection, transport, processing and marketing costs. Practise making your product until it is of a good quality. Give away some free samples and ask for feedback. Market your product to potential new customers.</p> | <p style="text-align: center;">Get help and support</p> <p>It is much easier to work as a team. Talk to the community with tailored messages about the benefits of waste management. Encourage them to get involved and become advocates. Get support from government by demonstrating the benefits of your approach. Share your work with other communities and be prepared to help them.</p> | | |

¹⁰ <https://wasteaid.org/toolkit/making-waste-work/>

| Be inspired: How to transform waste into a resource | | |
|---|--|--|
| C | Integrated waste management | |
| | 1 Measure your waste | |
| | 11 Waste collection | |
| | 12 Waste disposal | |
| | Organic wastes | |
| | 2 Woody waste into fuel briquettes | |
| | 3 Organic waste into biogas | |
| | 4 Fish waste into animal feed | |
| | 5 Organic waste into compost | |
| | 6 Organic waste into compost using worms | |
| | Plastics | |
| | | 7 Selling plastics to the market |
| | | 8 Plastic film into building materials |
| | | 9 Plastic waste into ecobricks |
| | | 10 Plastic film into crocheted bags |

Source: <https://wasteaid.org/toolkit/making-waste-work/>

To look into a case where this system has been adopted is in Da Chong, a small village in Phu Quoc, a Vietnamese island inhabiting over 1,485 people and is besides a marine protected area, and has become a testing ground for a new community-based approach to waste management. WWF-Vietnam have together with local authorities developed a pilot project that established a community-based waste management system, one that could prevent the community's waste from polluting the coastal environment, an environment that not only supports the livelihoods of many Da Chong residents, from fishing to aquaculture, but also harbors many marine species, including the rare and vulnerable dugongs.

The goal of the project was to establish a system in which solid waste would be segregated at the household level, valuable items would be utilized on-site, organic waste would be composted and trash would be collected and transported to a treatment site by a public collection service.

An agreement was reached between the local authorities and the community members of Da Chong, leading to the launch of the first community-based waste management program in the region, in September 2019. The project provided equipment, waste separation training, and technical support to the residents, equipping them with the resources to not only establish the program, but to also run the program independently.

An alternative model has been introduced in our very own country which is the Swachhtha App. The Swachhata App and Portal is used by citizens in aiding municipal corporations to identify unclean areas in 4,041 cities throughout India. When a citizen spots a cleanliness-related issue in the city, he or she can use the app to take a picture, choose a category and file a complaint, which is immediately monitored by a municipal corporation's designated officials. Complaints are then assigned by the nodal officers to the relevant field official who gets a notification on the SBM Engineer App installed on his or her phone. The assigned official then goes, resolves the complaint and takes a picture as a proof that the complaint is resolved. The status of the complaint being resolved and the picture is then sent back in the citizen app as a notification to the citizen that the situation has been rectified.

The citizen can then give feedback on how the municipal corporation performed on the complaint lodged by giving a "happy, neutral or sad" response and can also re-open the complaint if the citizen feels the complaint was not resolved at all.

Chapter 5 – Recommendations

As elucidated by a report prepared by IUCN for successful and sustainable tourism development there is a common need for:

- Effective tourism planning within and outside the site;
- Good governance of tourism that considers the site, in the context of a destination;
- Involvement and participation of stakeholders and especially collaboration between the private sector, local communities and the site management authority in relation to planning for sustainable tourism;
- Effective and innovative communication tools that add value to the site.

Figure 1: Framework for Analysis and Actions: 4 Ps Model



Source: Niti Aayog, 2018

The World Bank in their report (2021) have recommended the following for sustainable management of waste:

Institutions, Financing, and Stakeholders

- Develop local government policies and regulations in line with national guidelines and standards
- Operationalize the SWM system at the local government level through technical capacity development
- Involve local communities and CBOs in waste segregation and collection
- Create systemic opportunities to bring in economies of scale, engage the private sector as well as other stakeholders
- Enable integration of the informal sector to engage in waste management services
- Enable collaboration of related agencies, such as tourism, forest, and natural resource management
- Establish a monitoring and enforcement system to improve and sustain waste management services

Data Availability and Awareness of SWM Issues

- Coordinate with various agencies to improve data collection, availability, and to create public awareness
- Start data gathering as a continuous exercise in order to make better decisions, set targets, and monitor policy implementation
- Increase public awareness on managing waste and impacts of SWM in mountain areas
- Introduce and expand training programs to build capacity of local government staff and decision makers

Waste Generation and Segregation

- Enable source segregation to allow for value extraction and recycling of both biodegradable and non-biodegradable materials
- Enable separation of biodegradable waste for useful purposes at the household or community level
- Involve local communities and CBOs by considering various aspects, such as income generation
- Create policies to manage other wastes (C&D, hazardous, health-care, e-waste) in mountain cities

Waste Collection, Transfer, Storage, and Transport

- Improve waste collection systems and upgrade service delivery
- Establish waste storage and/or transfer systems to manage waste
- Enable sorting and processing of non-biodegradables for higher monetary returns
- Find innovative ways to collect and transport waste from mountain areas that are particularly challenging due to remoteness, topography, and lack of road network

Waste Treatment and Disposal

- Ban the open dumping and burning of waste
- Find suitable alternatives for treatment of non-biodegradable waste and for waste disposal

Source: World Bank, 2021

Through analysing the above document some of the key gaps which needs to filled in the coming years which would be crucial for the sustainable development of Uttarakhand are:

1. Awareness promotion strategies by the government.
2. Identification of the key strengths and weaknesses (SWOT analysis) for identifying the key areas which need further attention.
3. Heavy penalties imposed on anyone littering the areas and the intensity of the penalty should be increased according to the fragility of the area.
4. Multiple stakeholder discussions in every three months should be conducted such as adventure tourism board (ATOI), homestays, hotels, restaurants, NGOs etc. and the government to assess the challenges and implementation of the existing policies.

5. A uniform legislation for adventure tourism with regard to waste disposal needs to be formulated.
6. PPP needs to be strengthened as a key driver to promote sustainable tourism and proper waste disposal.
7. Further, promotion of zero waste and community participation needs to go hand in hand in developing ecotourism in the state.
8. Promotion of Circular Economy: Instead of the 'produce-consume-waste' linear model, a circular economy based on a restorative or regenerative design of industries, businesses, processes, etc. would minimize waste and promote sustainability throughout the life cycle. Treating waste as a potential resource and recovering materials from waste streams through recycling might generate revenue and make the value chain self-sustaining.
9. Strict enforcement of the SWM Rule 2016 should be adopted where no landfills should be constructed on the hills.
10. EPR norms should be strictly implemented creating no room for evasion of the laws formulated in this regard.
11. Generation of alternative employment opportunities should be generated which is in line with the environmental norms.
12. Data analytics should be utilised to identify the key risks in achieving the objectives of sustainable tourism.

Some of the ways in which employment could be generated for the state is through engaging the community in practices which would help mitigate waste; for example, in Madhya Pradesh an IFS officer introduced a biogas plant at an old-age-home, an oil presser machine and a spice grinder unit.

The objective was to help create employment opportunities for the villagers. The biogas plant played a detrimental role in mitigating waste in the area. Engaging the locals in traditional handicrafts, wooden straw- making and cutlery etc. can also be a way to generate employment. Promotion of "green jobs" by encouraging and investing in the implementation of a transformation in the agriculture sector into a sustainable, productive and environmentally balanced 'green agriculture' paradigm.

This would help lessen the burden on relying on the tourism sector for generation of employment. Such unique initiatives can help engage the locals in eco-friendly practices alongside generating income.

Chapter 6 – Conclusion: Way Ahead for Uttarakhand

There is, as highlighted above, a need to focus on pursuing an ecologically sensitive development. There is a need for community engagement in the government's development policies. There should be a system of Direct payments to Van Panchayats which will encourage them and local communities to conserve, protect and expand their forest cover. Such payments can also be in the form of free cooking gas cylinders delivered at the homes of village women who protect and nurture their forests. It will also bring down the demand for fuel wood from forests.

Ensuring remunerative livelihoods for mountain dwellers must be the second priority of economic development in Uttarakhand. Mountain agriculture has been neglected since India's independence because it does not generate large surpluses. Many farming families have given up agriculture and migrated away, but given its geography and climate Uttarakhand has a tremendous potential to produce remunerative niche crops. Hydropower development and tourism are major sources of revenue for Uttarakhand state. But they can also imperil large populations. Hence safety and sustainability have to be built into hydropower development, tourism and related infrastructure development activities. Alternate livelihoods can be generated through community-based tourism where local families host visitors. Their youth can act as guides, introducing the guests to scenic locations, local history, culture and foods. It can replace building massive hotels and resorts. Community-based tourism is a good model for sustainable and equitable tourism which can be modelled for the future.

A strong sense of communitarianism needs to be developed which would generate a sense of vigil in the masses. This can be done by weekly or monthly community awareness programmes using media such as newspapers, pamphlets, street plays etc. The need for stricter penalisation would ensure a sense of discipline amongst the tourists coming in, Sikkim should be mentioned here as how these penalties did not affect the tourists coming in the state. Alternative livelihoods can be generated by engaging the tribal population in developing sustainable use products such as recyclable paper, wooden spoons etc. Since most of the domestic tourists come either for religious purposes or for respite from the scorching heat in the plains in the weekends, the government should explicitly set a limit on the coming tourists especially in the destinations based in hilly areas. This can be using digital infrastructure in which registrations would have to be done prior entering the state. Data analysis should be conducted monthly to keep a track on the coming tourists in the states as well.

REFERENCES

1. Kothari, S.(2013), Development and Ecological Sustainability in India Possibilities for the Post-2015 Framework, Economic and Political Weekly.
2. Karnad, D., Krishnadas, M., Nair, T.(2013), Budgeting for Nature Economic Growth and Ecosystem Conservation in India , Economic and Political Weekly.
3. Rist, G.(2008), The History of Development; From Western Origins to Global Faith, Zed Books Ltd., pp. 173-195.
4. Sachs, W.(2010), The Development Dictionary; a guide to knowledge as power, Zed Books, pp. 24-38.
5. Joshi, B.,K.(2014), Environment and Development in a Sustainability Framework: An Exploration in the Context of Uttarakhand, ICSSR-UNIL Joint Seminar on "Social Dynamics: Indian and Swiss approaches, pp. 10-29.
6. Chopra, R.(2014), Uttarakhand: Development and Ecological Sustainability, Oxfam India, pp. 18-33.
7. Gazdar, S., C.(2021), Why did the Chamoli tragedy happen in winter; Identifying hotspots through vulnerability mapping and strengthening EIA can enhance preparedness and build adaptive capacity in areas most at risk from climate change, Down to Earth, <https://www.downtoearth.org.in/blog/climate-change/why-did-the-chamoli-tragedy-happen-in-winter-75472>.
8. Shahabuddin, G.(2021), Why Uttarakhand should choose a more sustainable path to development in a post-Covid world; Apart from mitigating climate change, forest conservation can solve problems such as out-migration, under-employment and human-wildlife conflicts in the state, scroll.in, <https://scroll.in/article/982140/why-uttarakhand-should-choose-a-more-sustainable-path-to-development-in-a-post-covid-world>.
9. Mazoomdar, J. (2021), Despite Supreme Court freeze, 7 Uttarakhand projects get ok, 1 flash-flood hit, The Indian Express, <https://indianexpress.com/article/india/supreme-court-moratorium-hydro-electric-projects-uttarakhand-flash-floods-7472781/>
10. Gosh, S. (2018), Push for “Zero Waste” in India’s mountain states, Mongabay, <https://india.mongabay.com/2018/05/push-for-zero-waste-in-indias-mountain-states/>
11. <https://plasticsmartcities.org/collections/reuse-recycling>
12. Lenkiewicz, Z. & Webster, M.(2017), Making Waste work: A toolkit, Wasteaid, <https://wasteaid.org/toolkit/making-waste-work/>
13. Pande, N. & Sharma, A. K.(2018), Why Uttarakhand's Ecotourism Development is Being Mismanaged, The Economic & Political Weekly, <https://www.epw.in/engage/article/uttarakhand-ecotourism-development-being-mismanaged>
14. <http://swachhbharaturban.gov.in/writereaddata/tookit-public.pdf>
15. Siedman, N. (2014), What does Zero Waste Mean? Zero is Zero, ZWIA, <https://zwia.org/policies/>

16. https://sustainabledevelopment.un.org/content/dsd/susdevtopics/sdt_pdfs/meetings2010/icm0310/2a_Agamuthu.pdf
17. GIZ(2018), Best Practices on Solid Waste Management in India - English and Hindi Versions - SNUSP II, sustainable sanitation alliance, <https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/2939>
18. <http://www.sikkimforest.gov.in/soer/Solid%20Wate%20Management.pdf>
19. <http://www.uttarakhandpalayanayog.com/pdf/NBT%20English.pdf>
20. Ministry of Tourism & Culture Department of Tourism Market Research Division
21. (2002), 20 YEARS PERSPECTIVE PLAN FOR SUSTAINABLE TOURISM DEVELOPMENT IN THE STATE OF SIKKIM, Horizon Industrial Consultancy Services New Delhi
22. Kumar, A. (2014), SIKKIM; A ROLE MODEL OF ECOTOURISM IN INDIA: A CRITICAL ANALYSIS, Indian Streams Research Journal
23. Borges, M., A., Carbone, G., Bushell, R. & Jaeger, T. (2011), Sustainable tourism and natural World Heritage, IUCN.
24. Report of Working Group II Sustainable Tourism in the Indian Himalayan Region, Niti Aayog
25. Ministry of Tourism (2021), National Strategy and Roadmap for Sustainable Tourism.
26. Thakur A., Kumari S., Sinai B., S., Prashant S., P., Kumar, A. & Kumar, R. (2021) Solid Waste Management in Indian Himalayan Region: Current Scenario, Resource Recovery, and Way Forward for Sustainable Development, Frontiers in Energy Research.
27. Governance For Sustaining Himalayan Ecosystem Guidelines and Best Practices, GB Pant Report
28. Sustainable SWM in Mountain Areas of India - World Bank Report 2021
29. Mesharam, V. (2021), Solid Waste Management in India; An Overview, Policy Frameworks, India, Government Initiatives and Opportunities, Public Policy <https://publicpolicyindia.com/2021/07/29/solid-waste-management-in-india-an-overview-policy-frameworks-government-initiatives-and-opportunities/>
30. Nitnaware, N. (2021), How an IFS officer Used 5000kg Plastic Waste to Generate Employment for 3 Villages, The Better India, <https://www.thebetterindia.com/263044/ifs-officer-madhya-pradesh-plastic-waste-electricity-biogas-employment/>
31. Herren, R., H., Bassi, A., M, Tan, Z. , Binns, W., P. (2011), Green Jobs For a Revitalized Food and Agriculture Sector, Food and Agricultural Organisation, http://www.fao.org/fileadmin/user_upload/sustainability/pdf/FAO_green_jobs_paper_March_31.pdf