



## Promotion of Countermeasures Against Marine Plastic Litter in Southeast Asia and India

## **Narrative Report - Promotion of Countermeasures Against Marine Plastic Litter in Southeast Asia and India**

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# EXECUTIVE SUMMARY

Ganga is one of the major rivers in India, that covers a distance of 2,525 km. A sacred river, GANGA is of high religious importance to the people of this country. It also provides livelihoods to millions and millions of people. A study by an Environmental Journal highlights that Ganga, due to anthropogenic activities, has been contaminated and is one of the world's top 10 rivers to carry plastic pollution in the ocean.

The project, Promotion of Countermeasures against Marine Plastic Litter in Southeast Asia and India aimed at reducing the inflow of plastic litter into river Ganga. Development Alternatives, with support from United Nations Environment Programme, conducted a perception study to analyse the plastic pollution in the river. As part of the programme, we also carried out various awareness generation activities, clean up drives and capacity building programmes in the two targeted cities - Haridwar and Prayagraj, Both the cities are of high religious importance and major events such as Kumbh is also celebrated.

Another distinct feature of identify the quantity and types of micro-plastic going into the sacred river. Project build a common platform where different stakeholders can come together to discuss, disseminate and initiate measures to remove plastic from the river. Development Alternatives also envisions to establish a value chain for safe disposal or recycling of plastic.

In both the cities different strategies were applied to achieve the goal. In Haridwar, major tourists and stakeholder groups are near Har Ki Pauri Ghat, all outreach activities were concentrated in and around this area. In Prayagraj, Magh Mela - a month and a half long sacred event - is celebrated in the month of January and February. Millions of devotees take dip in the holy water at Sangam. All outreach activities were concentrated around this area.

During the perception survey, a step by step methodology was followed and major hotspots were identified alongside the river. These hotspots were identified due to their prominence in terms of influx of visitors and presence of diverse stakeholders. In Haridwar, Har ki Paudi Ghar and in Prayagraj, Sangam was identified. These areas are heavily crowded during the auspicious months of Hindu festivals.

The specific stakeholders identified around these hotspots included religious institutions, schools, commercial buildings, households and civil society organisations. A sample was picked up from each stakeholder group to conduct the Focus Group Discussions (FGDs) and individual survey.

In order to record the real time data of plastic flowing into rivers, two clean-up drives were also organised in both the cities. It helped in quantifying the plastic material reaching the river and also check its quality. These activities were organised in support from National Productivity Council.

We also developed various outreach materials based on inputs received during the perception survey. These were developed in local languages and were used during awareness generation sessions.

- **Radio Program** - A 30 minute radio programme was developed which focused on significance of river Ganga, the issue of plastic pollution and what we can do to save it. The programme was aired by AIR FM, one of the most leading radio channels in India. It was broadcasted twice on both the stations i.e. Dehradun in Uttarakhand and Prayagraj in Uttar Pradesh. It reached to 12,420,000 people. DA has official broadcasting certificate from AIR FM.
- **Jingles**- Six jingles on key messages were developed and were used to spread the word during the campaign. These jingles were played thrice a day for seven days in both the cities through AIR FM. They were also played at loudspeakers installed near the river in prime locations.
- **Video** – An animated video was developed to spread the word to a larger audience. The video was played at Harki Paudi in Haridwar on LED screen everyday. It helped in reaching out to approximately 20,000-30000 visitors every day. This was also played covering the area of Sangam Zone and Civil

Lines. Development Alternatives has received an official letter from Smart City Limited, a company responsible for controlling the LED screens installed in the city.

- **Banners** – Different paper banners and standees were developed
- Pamphlets, Caps, Batches

Hence, by mapping the local resources available, DA created content which can be regularly used for awareness generation in the future too.

For capacity building workshops, Bridging the Information Gap sessions (BIG) were organised in schools, with shopkeepers, local boatmen, pilgrims, religious leaders, etc. These sessions were organised to assess the current knowledge of the group and subsequently a training workshop was organised to fill the knowledge related gap. More than 1500 people were reached through the capacity building programme. After awareness sessions in school, Eco-Clubs were formally formed with 8-10 students designated as their members. These clubs are formed with an objective of carrying forward the message of reducing consumption of single use plastic in schools.

Three awareness campaigns were organised in both the cities, by using creative means such as street plays, magic shows, signature campaigns etc. These were organised right before the mega event in both the cities, in order to build momentum. Nearly 5000 individuals were part of these campaigns.

One mega event was organised in both the cities, '*Humara Sankalp Plastic Mukta Ganga*'. The major aim of the event, was to build a common platform for diverse stakeholder to share their opinions and thoughts on the issue to spread awareness amongst the masses.

The mega event helped to spread the word to a larger audience by involving religious bodies, Academia, members directly involved with the river system. This joint effort will facilitate in reducing the current rate of dumping plastics into the river Ganga.

There were cultural programs to reinforce the message of plastic free Ganga. Stakeholders were felicitated for their sheer efforts in combating plastic pollution over the years. The event ended by a pledge taking ceremony followed by the Ganga Aarti. More than 2500 people participated in the Mega Event.

Understanding the importance of media (both print and social), to amplify the message and reach a wider set of audience group, media orientation workshops were conducted at both the cities right at the outset of the project. As per the strategy, the social media coverage was planned under three parts:

- Introduction to the issue
- Call to Action
- Connecting to Alternatives

Under these parts, different posts were shared. There was a specific template designed to ensure symmetry and synergy amongst all the posts. Two weekly posts were shared on Facebook, twitter and Instagram handles of Development Alternatives. Relative hashtags were used in all the posts.

Connecting to various and diverse set of stakeholders in both the cities was the USP of the project. Some supported in connecting to their network groups, while the other were a part of our intervention activities. To site an example, Ganga Sabha, a Ganga sabha is a century old registered entity responsible for maintaining Ganga at Har-Ki-Paudi old Ganga Management Committee in Haridwar, supported us in connecting to their network groups, especially the faith leaders and their institutions. With Ganga Sabha, a lot of awareness generation activities and Mega Event were organised at Har Ki Paudi, i.e. the prime location in the city. Naviks (local boatmen), shopkeepers, school students, religious leaders, were a part of our awareness campaigns and also volunteered in mega event and clean up drives.

Development Alternatives, entered into a new collaboration with faith leaders and their institutions, as both

the cities are of high religious importance to the people. Through them, we reached out to lakhs and lakhs of followers. They connected the message of ‘Say No to Plastic Littering’ with the religious sentiments and voiced their opinions to their followers.

Due to our efforts and strong collaboration, DA received a recommendation letter from the Municipal Corporation in Haridwar for working on waste management in the future.

Apart from this, collaboration was made with the local resource groups available. For example, Swachhagrahis are a group of 300 volunteers who are responsible for mobilising and creating awareness amongst pilgrims during Magh Mela. They create awareness mobile toilets and encourage people to not defecate in open. They also contribute in maintaining the cleanliness of toilets by giving timely information about the status of those. A capacity building workshop was organised for these volunteers, so as to mobilise people on reducing the use of SUP and not throwing or carrying the waste in the river (as they were already in the process of mobilising people on other issues). They helped us in reaching to lakhs of people. They were given pamphlets of the project which they distributed amongst the masses.

Also, with his team of sanitation workers collected 1500 PET bottles from the Mela. These sanitation workers are primarily responsible for collecting the garbage in liner bags placed in dustbins at the Sangam area throughout the year. The PET bottles were easiest to collect. Hence, to demonstrate a small value chain of source segregation and disposal, these bottles were collected and on the day of Mega Event they were handed over to the Municipal Corporation.

Similarly, a lot of potential, with respect to establishing a value chain for safe disposal or recycling of plastic was identified. A small value chain for demonstration is planned with support from Municipal Corporation in Haridwar, where non-saleable plastic (majorly single use plastic) is to be transported to Indian Institute of Petroleum in Dehradun to be converted into high grade diesel. Similarly, there is an organisation in Varansi, Uttar Pradesh, that converts single use plastic into oil. Many such initiatives were identified and connected to during the course of the project.

#### **The key findings in the project are:**

1. There is a conflict between religious practices and the need to reduce plastic use by the people. Since, both the cities are of high religious values and witness influx of lakhs of tourist population annually, the major littering in the river is through the religious practices such as leaving clothes, plastic cans, packaging of parshad in the river, which leads to plastic pollution. Involving religious leaders in this dialogue was thus significant as they are great influencers.
2. People are generally aware about the impact of plastic. But there was a little understanding on its complete lifecycle, and its impact on marine ecosystem, our health and the environment.
3. Current waste collection fleet does not support source segregation.
4. Most of the slum areas in both the cities are not included in the periphery of Municipal Corporation, hence no waste collection mechanism is present in such areas. This is one of the major leakage points as the slums are mostly situated near the river or drains. Hence no 100 percent waste collection is ensured in both the cities.
5. During our clean up drives we found that of the total waste collected, plastic waste contributed nearly 60 percent in Haridwar and more than 40 percent in Prayagraj.
6. Apart from some MLPP (Multi-Layer Plastic Packaging) which is sent to cement kiln, there is no value chain to dispose or recycle other forms of plastic. Some of the saleable plastic is picked up by the rag pickers at transverse station, rest everything is dumped into the main plant in both the cities.
7. Huge influx of people during festivals/melas – lack of capacity to deal with the waste. The way forward or key recommendations from the project are:
  - i. Pilgrim and tourist populations are major generators of plastic litter therefore those who deal with

this population must be the targets of training and behavioural change

- ii. Informal waste collectors to be included in the value chain so as to recover maximum plastic litter during collection
- iii. Collection system to be connected to CSOs making products out of waste material and also to recyclers. This would reduce plastic litter leaking into the river system
- iv. Slums to be included on the collection map of municipal committees.
- v. Strengthening the partnership and networks in cities especially with the city government and on ground stakeholders. we have established certain partnerships in both the cities which now needs to be leveraged in order to create an impact.
- vi. Pilot demonstration of some waste recycling/ co-processing solutions such as – SUP to IIPM for converting SUP to diesel, HDPE into sheets, MLPP to cement factories to be used as alternative fuel and shredding of PET bottles and the shredded plastic being recycled.
- vii. Enhance entrepreneurship around plastic recycling, technology and capacity development.

# 1

## INTRODUCTION

Recently, researchers at The Ocean Clean-up, a Dutch foundation developing new technologies for ridding the oceans of plastic, highlighted that a significant amount of the world's plastic in oceans enters through waterways in Asian countries.

Ganga, a sacred river in India is considered as living Goddess and worshipped by millions of people across the country.

The water of the river which was once considered to be extremely pure has today been polluted due to several of anthropogenic activities. Today, there is unmanageable plastic wastes including micro plastics flowing to oceans through major rivers such as Ganges and Indus. A study by an Environmental Journal highlights that Ganga, due to anthropogenic activities, has been contaminated and is one of the world's top 10 rivers to carry plastic pollution in the ocean.

The project, Promotion of Countermeasures against Marine Plastic Litter in India, a joint initiative of Development Alternatives and United Nations Environment Programme (UNEP), was launched in two cities, Haridwar and Prayagraj of Uttarakhand and Uttar Pradesh state, respectively.

The project aims at targeting plastic that is going into Ganga, through various awareness campaigns, clean-up drives and capacity building programmes. Another distinct feature of the project was conducting a study, to identify the quantity and types of micro-plastic going into the sacred river.

The project also aimed at building a common platform where different stakeholders joined hands to discuss, disseminate and initiate measures to remove plastic from the river. Development Alternatives also envisioned to establish a value chain for safe disposal or recycling of plastic.

### Objectives

- Identifying the sources and pathways of major plastic leakage
- Fostering local partnerships for leakage reduction
- Generating data and information on marine plastic pollution
- Implementing necessary actions

### 2.1. City Context

#### 2.1.1. Haridwar, Uttarakhand

India's most revered river – Ganga, is among ten rivers in Asia and Africa that transport 93 percent of the river-based plastics deposited into Earth's oceans. One of the identified cities along river Ganga was Haridwar, with population of 2.29 lakhs in an area of 12.3 sq. km. It is only in Haridwar, where Ganga enters the plains. Major events such as Kumbh, Ardh Kumbh is celebrated in the city which witnesses tourist influx of more than 20 millions (Source: District website).

The city alone generated 237 Tonnes per Day (TPD) of waste in 2015 which is projected to be 278 TPD by 2025, out of which 8.5 percent has been generated as plastic waste (source: IPE Global, 2009). There is a dire need to curb the plastics ending up in the Ganga by providing alternatives to plastic waste, promoting awareness amongst locals and visitors and including major city stakeholders and government officials into the agenda.

#### 2.1.2. Prayagraj, Uttar Pradesh

Prayagraj district is one of the largest and the most populous district of Uttar Pradesh. The three rivers of India - Ganges, Yamuna and the mythical river of Sarasvati - meet at a point in the district, known as Sangam, considered holy by Hindus.



According to the 2011 census of India, the district has a population of 15.4 lakhs in Prayagraj city as per Census 2011. As of 2011 it is the most populous district of Uttar Pradesh. Prayagraj Kumbh Mela is a major Hindu event. During 2019 Kumbh Mela, a record of 24 crore people took dip in the holy water of Ganga.

As per Municipal Corporation of the city, there are a total of 203 hotspots identified in Prayagraj, out of which they have managed to clean only 69 hotspots.

### 2.1.3. Diagram

A four-fold strategy of Assessment, Awareness, Action and Advocacy was used in the course of this project.

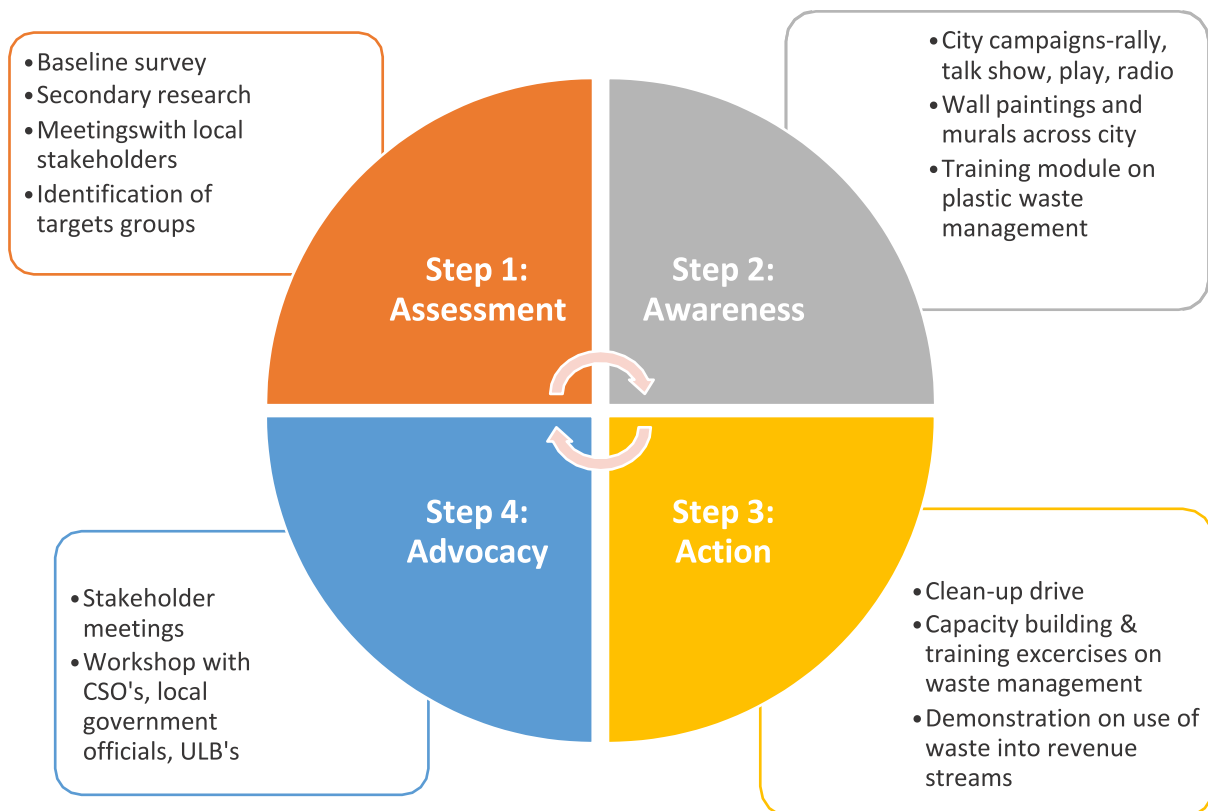
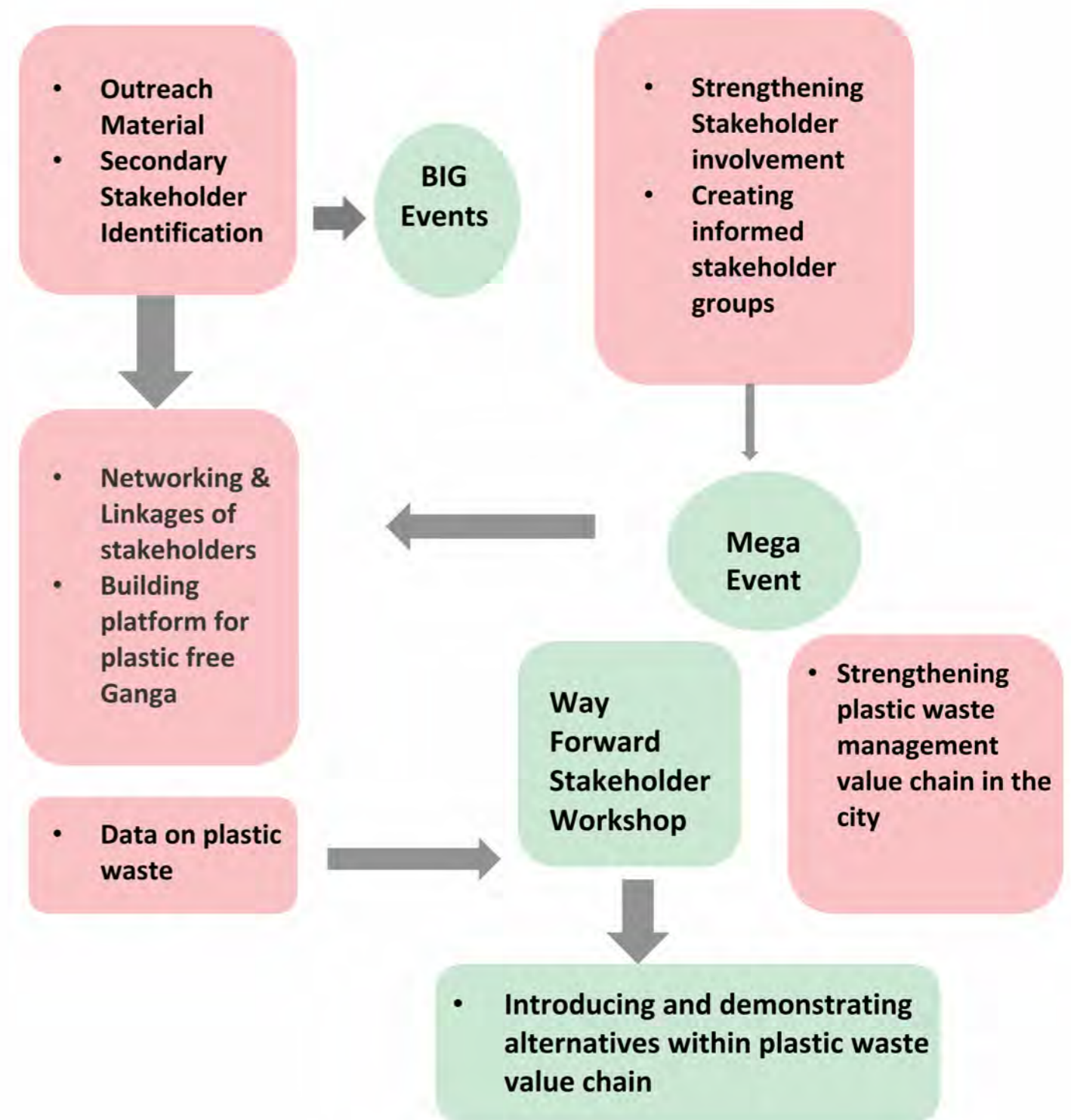
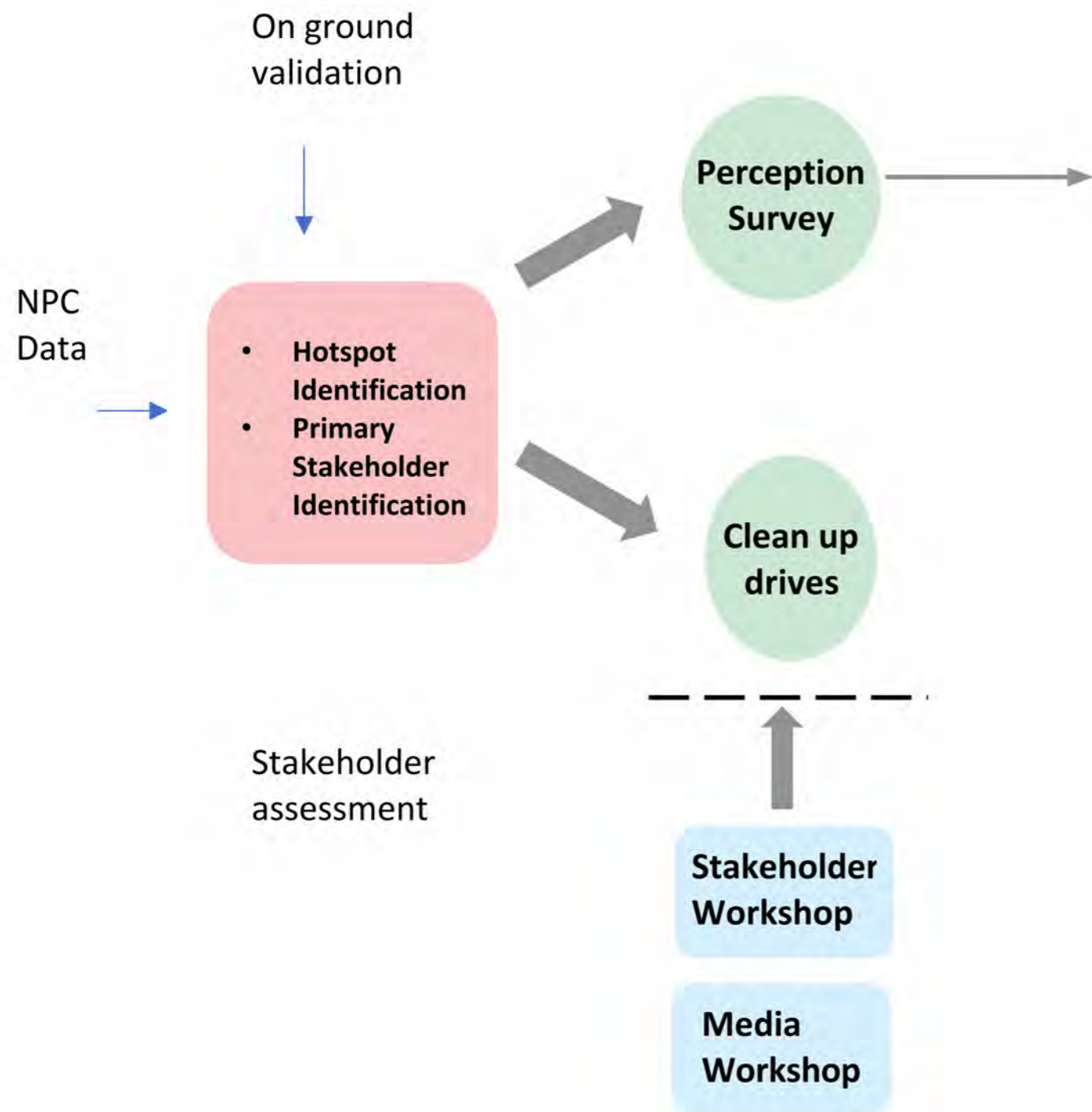


Figure 1: 4-A Approach



# The Overall Strategy:

- 1. Identification of hotspots** – In the initial stages, hotspots were identified through various steps:
  - Data provided by National Productivity Council (NPC) – Using their technical expertise, NPC provided a list of 4-5 potential hotspots area
  - On ground validation was done by the field team, and feasibility of the hotspots was checked and the list was then filtered
  - In some cases, such as Haridwar, there was a view taken by the stakeholder and then the hotspots were selected
- 2. Identification of stakeholders** – During the first few interactions in both the cities, a list of primary stakeholders was formed.
- 3. Data generation Activities** –

**Perception Survey** - Perception survey with the identified stakeholders was conducted in both the cities. Major objectives of this survey were:

  - To assess the level of awareness among identified stakeholder groups on plastic pollution.
  - To explore the possibilities of engagement and involvement of stakeholder groups in reducing plastic pollution in the city.

**Clean-up Drives** – Basic aim of these drives were to gather data in terms of types and quantities of plastic being generated in the cities near the banks of river Ganga. These drives were done in support from National Productivity Council.
- 4. Bridging the Information Gap Sessions** – Data gathered through perception surveys was used to develop outreach materials. These materials were used in awareness and capacity building programmes planned with different target audience in both the cities. Through such capacity building events, an informed and cautious groups were developed.
- 5. Mega Events** – Mega events were the culmination event of all the activities that were implemented at the field level. A common platform was created for different stakeholders to join in for a joint vision – Plastic free Ganga.
- 6. Final Stakeholder Workshop** – Majorly to disseminate findings and discuss way forward by sharing a learning document and a working paper with different stakeholders.
- 7. Demonstrating a value chain** – Introducing and demonstrating alternatives within the existing plastic waste management value chain in the city.

# 3

## PERCEPTION SURVEY STUDY

### 3.1. Haridwar

Haridwar, due to its religious importance is a hub of religious institutions and leaders, each with a great capacity to influence thousands of their followers. Hence, these religious institutions have been identified as one of the most potential stakeholders in the city for outreach. Another major stakeholder was Haridwar Municipal Corporation which is in charge of solid waste management in the city. They have given contract to KRL waste management Pvt. Ltd. who in turn is responsible for door to door waste collection in the city. They are the major waste management planning and implementing agencies in the city. Apart from this, Haridwar accommodates on an average 1.65 lakh visitors each year and host some of the major religious events (Kumbh and Ardh Kumbh). On an average 1.65 lakh visitors each year shops, hotels, ashrams, restaurants have come up which are also one of the major consumer and seller of plastic items. In addition the major stakeholders in the city are its residents and educational institutions.

The perception on plastic pollution in the city of these major stakeholders is the need to assess the current scenario of plastic pollution in the city and plan campaigns, awareness programs and alternatives to plastic to further promote the countermeasures against plastic waste in rivers.

A step by step methodology was followed to conduct the survey - Major hotspots were identified along the river which could be the major contributor of the plastic waste into Ganga. Among which Har ki Paudi Ghat was identified as one of the most potential hotspot due to its prominence in terms of influx of visitors and presence of diverse stakeholders around. This is also the main area visited by the pilgrims. The area is heavily crowded during the auspicious months of Hindu festivals. Apart from this, other hotspots identified were Vishnu Ghat and the parking area which is crowded with the visitors and considered.

#### 1. Demographics

- Following are the specific stakeholders identified around the hotspots including religious institutions, schools, commercial building, households and civil society organisations. A sample size was picked up from each stakeholder group to conduct Focus Group Discussions (FGDs), interviews and questionnaire survey.

S.No.	Category	Stakeholders	Sample size for FGDs/interviews/ Questionnaire survey
1	Religious Institutions	a. Shri Ganga Sabha	FGD with 7 members + 3 <i>Safai Karamachari</i> of Ganga Sabha
2	School	a. Panna Lal Bhalla Municipal College	Questionnaire survey with 70 students+ interview with school principal
3		b. Anandmayi Sew Sadan Inter College	
4	Commercial	a. Market shops	10 shopkeepers+ Interview with head of shopkeeper's committee
5		b. Ashrams	Interviews with 8 Ashram management heads
6	Households	a. Low Income Residential Area	FGD with 15 residents
7		b. High Income Residential Area (Govindpuri colony)	Questionnaire survey with 10 households
8	Civil Society Organisation	a. Being Bhagirathi	Interview with the founder of the organisation

## 2. Knowledge about polymers

- Forty-Four percent students perceive that they know little about plastic pollution, while 32 percent perceive that they know quite a lot.
- The knowledge and general awareness level of stakeholders on plastic waste – shopkeepers, residents, - was adequate.
- Shopkeepers understood that plastic is a concern, but 3 out of 5 pointed at the impact ‘as a little’ by while 2 out of 5 says that the problem is ‘quite a lot’.

## 3. Knowledge of products and packaging made in part or whole with plastics

- Plastic cans have been identified as one of the widely used plastic items by the visitors to carry Gangajal (water from the holy river Ganga) to their homes. Since the water is considered auspicious, the containers are not thrown in dustbins and rather immersed back in Ganga. These cans are made of low-grade plastic which cannot be reused or recycled. In addition to that the capacity of these containers is less than a litre and it costs very less, hence it is bought and used in bulk.
- The most common type of plastic used is use and throw plastic cup, plastic water bottle, plastic bag and medicine box.

## 4. Reasons for preferring products and packaging with plastics

- 60 percent of the students surveyed said that the primary reason for use of the plastic is the low cost and wide availability.
- The major reason of plastic use identified among various stakeholders was easy availability, and less cost. One of the reasons for using plastic items was also identified as lack of alternative materials available in similar availability and cost.

## 5. Knowledge about plastic waste management

- As per school teachers interviewed, students are aware about plastic waste management as they keep getting involved in various campaigns organised by various organisations like NSS, World Wide Fund (WWF) and Sparsh Ganga.
- The stakeholders have adequate knowledge about plastic waste management. Among shopkeepers, only one out of four shopkeepers did not know about the process of recycling waste.

## 6. Knowledge about effects of plastic on environment and health

- The three major causes of concern due to plastic pollution identified among children were release of toxic chemicals in the environment, it makes their city look ugly and is a threat to aquatic life.
- All the shopkeepers are aware of the consequence of improper removal of plastic waste on environment and waste segregation.
- The knowledge and general awareness level on plastic waste of stakeholders – shopkeepers, residents, students are adequate. While they are quite aware that plastic waste is a problem but the larger impact on environment, their city and health of city residents is not realised.

## 7. Perception about what needs to be done to reduce plastic pollution

- All the students surveyed felt that the disposal of plastics should be taught. Though 50 percent of the students surveyed did not agree to the pre-emptive measure such as complete bans on plastics.

## 8. Steps taken to manage plastic waste at individual, community or government level

- **Shri Ganga Sabha** conducts daily Arti at Har ki Paudi. Since 2012 they have been urging people, who participate in Arti, to take pledge to keep river clean, which is attended by almost 10-15,000 pilgrims on daily basis. Apart from this, they have their own Suchna Prachar Kendra where announcements are carried out on daily basis for the to throw waste into dustbins and keep river clean.

- **Ashrams** – The initiatives have been taken to replace entire plastic and thermocol cutleries used in the ashram to non- plastic cutleries – like use of steel, paper etc. Also, posters with instruction ‘Say No To Plastic’ have been put up on the walls of the ashram for awareness.
- **Being Bhagirathi (Local NGO)** – Taken an initiative to collect thrown away clothes from ghats of Ganga and transport them to Kankhal, Saprishi and Satkul area near Haridwar to convert them into cloth mats. As part of this initiative they have setup up cloth collection bins at Har ki Paudi.
- **Haridwar Municipal Corporation** – There have been initiatives to ban plastic bags. Although the alternatives to plastic bags proposed by the municipality are non-woven polypropylene (PP) bags which can be recycled but since they are made of recycled plastic, they are not completely plastic free. There is still a threat of these bags ending up in the river.
- **Private companies and government agencies** like Hindustan Unilever Limited (HUL), Bharat Heavy Electricals Limited (BHEL) have initiated community level waste segregation and disposal programs at their established employee colonies in the city.

## 9. Awareness about alternatives to products and packaging using plastics

- Most of the school children surveyed are aware of alternatives to plastic. The most common alternatives as described by the students were majorly cutlery items – paper, copper, edible etc.
- As an alternative to plastic cans, shopkeepers suggested to introduce and promote the use of cans made of high grade plastic which can be collected and recycled.
- All types of plastics are generally used by shopkeepers and the major reason for using plastic items is that they are cheaply available.

## 10. Willingness to forego plastic products and packaging

- **Half of the shopkeepers surveyed said that the correct method of plastic disposal should be taught.** Though other half did not feel the need to know the correct method of plastic disposal as it does not affect them.

## 11. Perception about impediments to effective action on reducing plastic production consumption and management

- As per most of the stakeholders, dustbins and waste collection containers should be provided in the streets to avoid littering of waste which eventually end up in the river.
- As per on-ground assessment, in order to prevent the burning and dumping of waste into river from slum settlements, it is essential to setup waste collection containers nearby the settlement and transportation system to collect waste from these containers by municipality.
- **Shri Ganga Sabha** - While discussing about the alternatives to reduce plastic waste, suggested to bring in a cost- effective alternative to plastic cans which is the only plastic item used at ghats for religious purposes. Apart from that, entry points of the city like bus stops, car parking and railway stations should be targeted to conduct awareness activities for visitors. They suggested awareness should be intertwined with religious sentiments of visitors like any shlok (key message) from the holy book of Gita. Some even suggested titles like ‘*Dharm nagri main pravesh Kar rahe hain, isses swachh rakhna apki zimmedari hai*’.

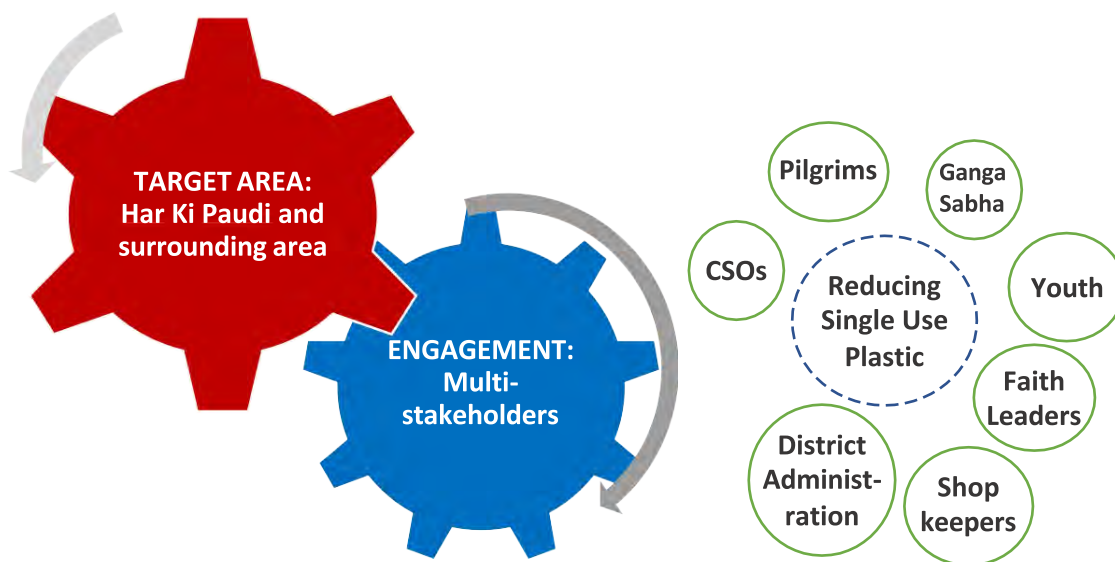
## 12. Sources of information about plastics

- Awareness programmes on plastic pollution in general and pollution in rivers are prevalent in the society. The major source of awareness for Vypar Mandal (Shopkeepers) are the campaigns conducted by the Haridwar Municipality Corporation.
- The major source of information among children are social media and TV.
- ✓ Stakeholder potential:
- Involvement of shopkeepers and Ashrams has a great potential to target visitor for minimizing the use and littering of plastic.

- Involvement of high-income group settlements in waste segregation initiatives.
- Involvement of school children in outreach activities has a great scope for spreading out messages to city residents, as children's major source of information are other children and their families. TV, Radio and social media are major sources of information

### Networking and Collaboration with the identified stakeholder during perception survey

One of the major USP of the program was connecting to diverse and multi-stakeholders throughout the course of intervention.



**Figure 2: Networking and collaboration with different stakeholders in Haridwar**

The target area selected was Har Ki Paudi, the main area in Haridwar as the major influx of tourist population is in and around this area and there are diverse stakeholders involved. At any given time, there are thousands of pilgrims, religious leaders and locals present in the area.

The impact that could be witnessed in this area, thus can be manifold times. Hence, the major interventions and outreach activities were planned in this area.

We reached out to diverse stakeholders so that they could help us spread the message to every nook and corner of the city. For this, efforts were to collaborate with key local stakeholders who can play a significant role in influencing the public to a larger extent. Some of the collaborations and networking established are:

- **Ganga Sabha**, is a registered river management committee, working for over 10 decades in managing the main bank of the river in the city, i.e. Har Ki Paudi. They were involved right from the beginning. They have a major control over the area and has the power to influence pilgrims, shopkeepers, local community, local religious leaders and their followers, etc.
- **CSOs**, were also reached out to during the intervention. Being Bagirithi and Village Development Society, volunteered throughout our outreach activities.
- **District Administration**, especially Municipal Corporation and Mela Adhikari have been supportive throughout the course of project. They have never hesitated in providing support and cooperation in the form of actively participating in our activities, issuing orders. Volunteers from Aakanksha Enterprise (a private firm given the contract of cleaning banks of river Ganga), NRLM, KRL (a private firm given the contract by Municipal Corporation for solid waste management in the city) have actively participated in our clean-up and other outreach activities in the city.
- Different **faith leaders** were reached out, for instance Kailashanand Ji from Agni Akhadha, Hari Giri Ji from Akhil Bharitiya Akhadha, Advshanand Ji, etc. They have lakhs of followers throughout the country and have influencing power to convince people of minimising the usage single use plastic.

- President of **Shopkeeper Association**, showed willingness and a desire to work on curbing plastic pollution generated through the shops. Shopkeepers have been reached out through him during various activities.
- **Youths and pilgrim** population have been reached through various activities such as street plays, signature campaigns, etc.

Our work and journey has always been enriched by involving such diverse stakeholders and incorporating their suggestions in our project.

They have played a vital role in getting the impact numbers from the ground and always acted as a catalyst and facilitator in ensuring that message is reached loud and clear to most of the target audience.

Because of our efforts, DA has received an official recommendation letter from Municipal Corporation in Haridwar for working on waste management in the future as well.



**Figure 3: Recommendation letter from Municipal Corporation in Haridwar**

## Stakeholder Meeting

Stakeholder meeting was organised in the month of December at the hall of Municipal Corporation. District Administration religious groups and CSO partners participated in the meeting.

The other meeting on the same day was called by Ms. Saloni Goel from UNEP. Major discussion and action points from both the cities are:



Table 2: Summary of the stakeholder meeting held in Haridwar

DISCUSSION POINTS	ACTION POINTS
<b>Historical and religious relevance of Ganga for people, and its reflection upon its physical status</b>	Should produce literature emphasising on the piousness of the river
	Historically clothes were not thrown into the river after last rituals and this should be emphasised in the communication
	This communication should be on the hotspots where there is major footfall (Har ki paudi, bridges across the river, Subhas Ghat)
	The people should be sensitised about the Ganga through their religious sentiment of purity
	Religious TV channels should be roped in to spread the message
	10 odd messages should be created along with the religious/spiritual leaders sharing the concerns for the sustenance of Ganga along religious terms
	Pledges should be taken by the religious leaders to stop the use of plastic in their ashrams and should promote the same among their followers
<b>The source and quality of plastic</b>	The communication should focus on the alternatives not just the problems
	Installation of more dustbins for flowers, clothes, plastics along the hotspots and their maintenance
	Stricter implementation of the ban on plastic policy of the state; Police patrolling unit can be established for the same
<b>Nagar Nigam has started the process of segregation with certain organizations though it is not very effective</b>	
<b>Communities where the process of segregation has started are mostly the government societies</b>	
<b>KRL has been segregating the waste but the quality is compromised. The plastic waste is transported to Mumbai and Rajasthan but o actual chain for disposal has been established</b>	
<b>The Sunehra kal work model was discussed as the case study</b>	
<b>Bridging Information Gap sessions</b>	Intervention should take place with Moti Bagh shopkeepers, 200-300 of them
	Recyclers should be involved with the emphasis on the financial incentives through plastic waste
<b>Cleanliness drives</b>	Bhramakumaris shall be invited for the cleanliness drive at Vishnu Ghat
	Survey shall be conducted on the hotspots before and after cleanliness drives

The team also visited a faith leader in Rishikesh, Uttarakhand with Saloni Goel from UNEP and Subhi Dhupar, Regional Director-URI to look out for possibilities of collaboration.

## प्लास्टिक को गंगा में जाने से रोकने के लिए हुई बैठक

कड़की बट्टी विशाला आवुप हरिद्वार डबलपैन्ट अल्टरनेटिव नई दिल्ली ड्राग यूएनईपी के सहयोग से प्लास्टिक मुक्त गंगा सफाई अभियान



कतह हरिद्वार नगर निगम सभागाए एवं एचआरडीए गस्ट हाकस में सक्कारी विभाग एवं संस्थाओं के साथ बैठक का आयोजन हुआ। जिसमें विनोद नेमर सोबीओ, नगर निगम प्रमुख अनिता शर्मा, नगरपालिका सल्लोनी, सुअरआरई से सुभा, नगर निगम कर्मचारी को, मंडी मजिस्ट्रेट हरिद्वार,

गंगा सभा के उपाध्यक्ष, विंग फगोरिपी अध्यक्ष रोहर पालेवाल, डबलपैन्ट अल्टरनेटिव से गहुल भाग्दान, अरबी सेनी एवं अन्य संस्थाओं के लोगों ने भाग लिया। जिसमें सभी ने अपने विचार रखे। सभा की ओर से बताया गया कि गंगा पर जो भी अवरोध, उसे हटाने पर तैयार करके जितने समय बचाव जायें। रोहर पालेवाल ने प्लास्टिक एवं कपड़ों को अलग करने के लिए प्लस लगाने के लिए कहा। गहुल भाग्दान ने पी कार्यक्रम को जानकारी दी तथा तीन महीने में गंगा में प्लास्टिक रोकने के लिए क्या करम उठाने जा सकते हैं, उसके बारे में बात की। इस मौके पर लक्ष्मीर सिंह, अरजु, अरकर अरवी, आर्कल मेष आदि मौजूद रहे।



Figure 4: Stakeholder meeting in Haridwar

### 3.2. Prayagraj

Major hotspots were identified along the river; which were the major contributor of the plastic waste into Ganga. Among which Sangam was identified as one of the most potential hotspot due to its prominence in terms of influx of visitors and presence of diverse stakeholders around. This is the main area visited by the pilgrims. The area is heavily crowded during the auspicious months of Hindu festivals.

The perception survey contained set of questionnaires to understand the knowledge level of the participants, their views/perception towards the plastic pollution, current practices of single-use-plastic its disposal and harmful effect on the environment especially on holy river Ganga.

### 1. Demographics

Table 3: Category of respondents during perception survey in Prayagraj

S. No.	Category	Stakeholders	Sample size for FGDs/interviews/Questionnaire survey
1	Religious Leaders	a. Tirth Purohits	FGD with 10 purohits
2	Temples	a. Alopi Mandir, Janapati	Interview of pandit
		b. Viman Maandapam	Interview of pandit/manager
3	Schools	a. Junior high school, Jhusi	Questionnaire survey with 20 students
		b. Junior High school, Havliya	Questionnaire survey with 25 students
4	Commercial	a. Market shops	FGD with 10 shopkeepers
5	Households	a. Low Income settlement	Questionnaire survey with 50 HHs
		b. High Income settlement	Questionnaire survey with 50 HHs
6	Others	c. Ragpickers	FGD with 30 ragpickers
7		d. Naviks	FGD with 15 naviks
8		e. Kalpvasis	FGD with 5 kalpvashi

### 2. Knowledge about polymers

- The general awareness level on plastic waste of stakeholders interviewed is present, with most of them having an idea of plastics as a cause of concern. The extent of the problem caused by plastics, its impacts on health and environment is not realized by the many.

- Fifty-three percent of students surveyed responded that they know little about plastic pollution, while 40 percent responded that they know quite a lot.
- Forty-two percent boatmen surveyed responded that they know little about plastic pollution, while 33 percent responded that they know quite a lot.
- In slums Sixty-seven percent households surveyed responded that they know little about plastic pollution, and 22 percent responded that barely know about plastic pollution.
- **As per interviews conducted with local Pandits**, they are aware of the impacts of plastic and plastic pollution on the river-bed. According to them the major source of plastics is the *tirth yattris* who bring food in plastics, locals don't throw plastic in the river.
- **As per interviews conducted with Kalpvasis**, most of them are aware about the ill-effects of plastics and support the use of its alternatives.

### 3. Knowledge of products and packaging made in part or whole with plastics

- As per Naviks, the plastic packaging of feed for Siberian crane is thrown by the visitors.
- The use of plastic is widely prevalent with the stakeholder interviewed in the form of use and throw plastic cups, plastic bottles for sanitary products and the plastic medicine boxes.
- Also, as perceived by Naviks and other stakeholders near Sangam, the most common type of plastic used is use and throw plastic cup.

### 4. Reasons for preferring products and packaging with plastics

- Thirty-eight boatmen said that the primary reason for use of the plastic is their light weight.
- 38 percent of the students surveyed said that the primary reason for use of the plastic is the low cost and wide availability.

### 5. Knowledge about plastic waste management

- Sixty-two percent of the Naviks had an idea of waste segregation, while only 15 percent had an idea of recycling.
- In Slums, less than half of the households have an idea of waste segregation and recycling. High income settlements- Eighty-two percent of the households have an idea of waste segregation while only 58 percent know about recycling. 100 percent of the households are aware of environmental consequence of improper plastic removal and disposal.
- It was found that Kalpvasis were aware of segregation of waste, but are not aware of recycling of waste. Some think that burning is a solution to get rid of plastics, but not aware of proper means of disposal of plastics.

### 6. Knowledge about effects of plastic on environment and health

- Ninety-six percent of the students surveyed had an idea of waste segregation and recycling. While, only 80 percent of the students were aware of environmental consequence of improper plastic removal and disposal.
- As plastic problem perceived by the Temple boards, plastic is the major reason for the extinction of biodiversity and the most problematic is plastic eaten by cows.
- Seventy-one percent of the Naviks were aware of environmental consequence of improper plastic removal and disposal.
- In slums, higher percentage (85 percent) of the households were aware of environmental consequence of improper plastic removal and disposal.

### 7. Perception about what needs to be done to reduce plastic pollution

- Seventy-three percent of Naviks felt that the disposal of plastics should be taught. They were divided in the opinion of whether plastics should be banned, for half of them it is a great solution, while for

the other half thought than plastic ban is not necessary.

- As per Shopkeepers, At the Sangam area there are dustbins installed at regular intervals, but there are no separate bins installed for segregating plastics. Hence that must be incorporated.

## **8. Steps taken to manage plastic waste at individual, community or government level**

- Local Pandits near Sangam area prohibit visitors from carrying plastics to the river. Pind daan (ritual of the deceased by their family member) is done in pattal (plates made using leaves). Also, the Prasad is served in Pattal or steel plate.
- Kalpvasis suggested alternatives such as Jute bag. They felt the need to create awareness '*Nijad pana aniwarya hai*'.
- Temple board inform people about the problems of plastics and restrict the use of plastics in the temple. Also, the major waste created by the temple were coconut shells and flower, out of which, flowers were used to make compost.
- The Naviks inform the visitors about the problem, also they have installed dustbins in their boats.
- Prayagraj Nagar Nigam has been working towards clean city; the city has banned the use of plastic bags. The bins have been installed at regular intervals and are cleared regularly. Still there are initiatives missing such as installation of blue and green bins. In addition, collection systems from low income settlement are missing, as a result most of waste ends up in the river.

## **9. Awareness about alternatives to products and packaging using plastics**

- Most of the school children are aware of alternatives to plastic. The most common alternatives as described by the students were majorly cutlery items – paper, edible or wooden cutlery.
- Some of the stakeholders like Kalpvasis and shopkeepers were aware of the alternatives like jute bags.

## **10. Willingness to forego plastic products and packaging**

- The temple board thinks that people should be made aware of the problems of plastic pollution and they are in favour of a campaign against use of plastics. He supports the promotion of alternatives to plastics. They also support the enforcement of bans by seizing and imposing penalties.
- Ninety-six percent of students surveyed felt that the disposal of plastics should be taught. Forty-five percent of the people were not bothered by the ban of plastics, while thirty nine percent felt that it is a great solution.
- Every stakeholder agreed that there is a need to create awareness for spreading the message of effects of using plastic. Common platform which can be used to increase the outreach of the activity are TV, Radio or newspaper and magazines.

## **11. Perception about impediments to effective action on reducing plastic production, consumption and management**

- Pandits felt that a ban of plastic from the factories is necessary. Alternatives such as steel plates are recommended to conduct puja.
- Also general awareness of people about plastics is necessary. If people are aware of the problems of plastic they may not be eager to use it and that can bring a major change.

## **12. Sources of information about plastics**

- Around 90 percent of the students surveyed said that the major source of the information is Newspaper and magazine.

The major influx of tourist is during the month long event near Ganga, called Magh Mela. So it was decided that all our outreach activities will be concentrated to this particular area to witness a wider impact.

Thus all the activities around creating awareness on reducing the consumption of single-use plastic was focussed in this month at Sangam area. Capacity building and orientation programmes were conducted with local sanitation workers, pilgrims, naviks, faith leaders, swachhagrahis, shopkeepers. All this while there was support from the District Administration, especially Municipal Corporation.

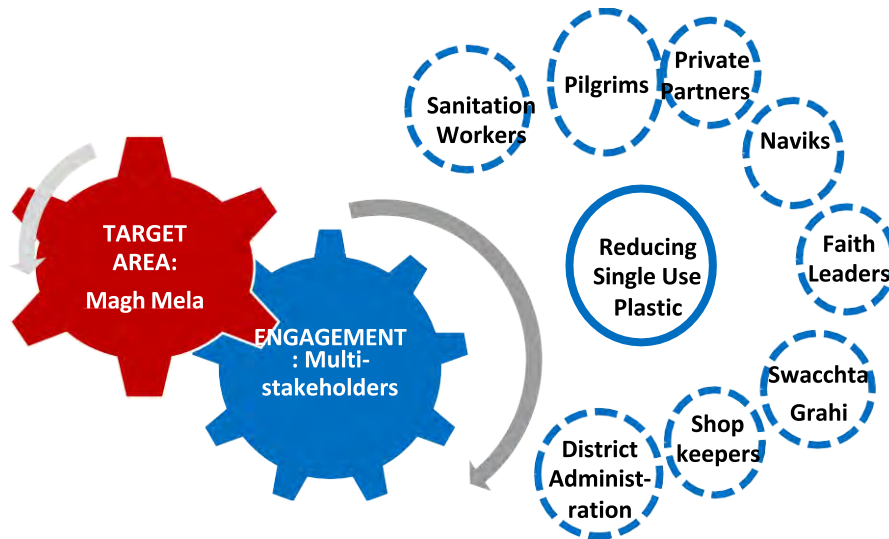


Figure 5: City specific approach - Prayagraj

# 4

## CLEAN-UP ACTIVITIES AND CAMPAIGNS

In order to reduce plastic waste in the river of each city, it is essential to gather data on quantity and types of plastic generated in the city. Thus in partnership with National Productivity Council (NPC) clean up drives were conducted in both the cities to gather the required information on plastic waste.

Right from the process of identifying the hotspots for clean-up drive to various leakage points from where plastic waste end up in the river - were identified – first through GIS based spatial analysis by NPC and second through on-ground assessment of the hotspots by Development Alternatives team. The on-ground assessment provided the scale of the problem and need of interventions at micro and macro level in order to cater the problem.

The drive was also conducted as a part of awareness activity among locals and various key stakeholders involved in the waste management of the city. In these clean-up drives volunteers were mobilised from diverse stakeholder groups – ragpickers, sweepers, representatives from local NGO's and representatives from organizations which are specifically involved in the waste management of the city.

Volunteers were trained in appropriate methods of collection, segregation and transportation of plastic waste and their participation was nudged through various awareness activities like pledge wall and building knowledge on basic information on plastic waste.

Clean up drives were conducted in both the cities to gather data on quantity and types of plastic waste which goes into the river Ganga. The collected data was further used to assess the usage pattern of various types of plastic and to further develop a scope of work for plastic waste value chain initiatives for its appropriate disposal in the city.

### 4.1. Clean-Up Drive

#### 4.1.1. Clean-Up drives in Haridwar

The clean up drive were conducted at two locations in Haridwar - near Vishnu Ghat, one of the prominent ghats in the city and other one at Pantdeep Parking area which is one of the entry points for the visitors in the city and hence witnesses high footfall resulting in high plastic waste littering.

The two locations were selected considering from where variety of plastic waste could be collected which eventually ends up in the river Ganga.

Almost 100 volunteers were mobilised at each hotspot, which came out as a group of diverse stakeholders, included - representatives from Aakanksha Enterprise (waste management organization in Haridwar, specifically manages waste from 72 Ghats in the city), representatives from National Rural Livelihood Mission (NRLM), College students, ragpickers, representatives from Adarsh Yuva Samiti (local CSO partner) and volunteers from other ongoing projects of DA in Haridwar city.

The drive was conducted for almost five hours and it included the following activities – demarcation of the selected area, first hand weighing of the collection bags, collection of all types of dry waste from the demarcated area, weighting of the collected mixed waste and first hand segregation of the mixed waste into plastic waste and other waste. The segregated plastic waste was weighed. And then we also calculated the the total percentage of plastic waste from the total waste collected.

Second part of the drive included second hand segregation of plastic waste in to various types of plastic. Each type of plastic waste was weighed separately and number of plastic pieces were counted and documented.

The final part of the drive ended with an appropriate loading of collected segregated waste into Municipal waste collection vans and sending it to the Municipal collection center for disposal. At the end of the drive, certificates were distributed to the volunteers and pledge were taken by the volunteers by printing their hands on cloth and signing on the cloth.

**Table 4: Highlights of Clean-Up drive in Haridwar at two different sites**

S. No.	Location	Stakeholders/ Institutions	Outreach Number	Major highlights
1.	Vishnu Ghat	NPC, Aakanksha Enterprise, NRLM, College students, volunteers from other DA projects	100 volunteers	Area- 1221 sq.m Total waste collected – 186 kg Total plastic collected- 113 kg (61% of total waste collected) Types of plastic – 21 types of plastic - Multilayer food wrappers, polythene and polyester + light packaging were the major varieties in mass / weight terms here
2.	Pant Deep Parking	NPC, Aakanksha Enterprise, NRLM, College students, volunteers from other DA projects	100 volunteers	Area- 1345 sq.m Total waste collected – 48 kg Total plastic collected- 32 kg (67% of total waste collected) Types of plastic – 14 types of plastic - The major plastics here in mass / weight terms are found to be polythene packaging, multilayer packaging and thin silver foils



**Figure 6: Before and after photographs at Vishnu Ghat**

The other cleanup drive was organised at Pant Deep Parking area. It is a major parking area near the bank of Ganga river. Mostly tourist population park their vehicles here, hence, a major hotspot where plastic waste is generated.

✓ **Other highlights from clean-up drives:**

In both the cleanup drives, volunteers were given certificates, caps and batches. All the safety methods were ensured as detailed by NPC. Several joint calls were done with the NPC team to guarantee smooth drive. Municipal Corporation was present at the drive and entire waste was handed over to them.

More than 100 volunteers participated in both drives with full enthusiasm and motivation. They understood the importance of keeping the river and city plastic free and pledged by pasting their coloured hands on a piece of white cloth of minimising the use of single use plastic and keeping the river Ganga plastic free.

More than 150 such signatures were collected throughout the cleanliness drives. Volunteers from Akanksha Enterprise who is officially designated to keep banks clean were also present in both the drives. Municipal Corporation was very supportive in allotting the land and looking after other arrangements in both the activities.

#### 4.1.2. Clean-Up drive in Prayagraj

The locations selected for the clean-up drive in Prayagraj were – area near Amitabh Bachan Puliya which is located just near the river bed. The second location identified for the drive was below new Yamuna Bridge in Arail area, Naini at Kumbh area which is located approx. 100m distance from the river.

Almost 75- 80 volunteers were mobilised for each hotspot, which came out as a group of diverse stakeholders, including - ragpickers, municipal sanitation workers, college students and representatives from SWARG (Local CSO partner), Swachhagrahis.

**Table 5: Highlights of Clean-Up drive in Haridwar at two different sites**

S. No.	Location	Stakeholders/ Institutions	Outreach Number	Major highlights
1.	Near Amitabh Bachan Puliya	NPC, Ragpickers, Safai Karamchaaris, Local Community, College Students	80 volunteers	Area- 1380 sq.m Total waste collected – 359 kg Total plastic collected 134 kg (37 % of total waste collected) Types of plastic – 10 types of plastic - The major plastics variety in mass / weight terms were nylon sacks, multilayer plastics and Thin polythene
2.	Below new Yamuna Bridge in Arail area, Naini	NPC, Ragpickers, Safai Karamchaaris, Local Community, College Students	75 volunteers	Area- 862 sq.m Total waste collected- 342 kg Total plastic collected- 35 % of total collected waste Major types of plastic- Polythene bags (less than 50-micron category), milk packets, pharmaceutical wrappers, spice packets, injections, canes, plastic cement bags etc.



**Figure 7: Before and After photographs from the site near Amitabh Bachan Puliya**



## 4.2. Outreach activities

Run-up events or activities were organised before the Mega Event in both the cities - Haridwar and Prayagraj with the objective of creating mass awareness on problems of use of plastic and its impact on the rivers and ultimately to Oceans. These events were done through the traditional and creative methods of mass dissemination such as nukkad natak (street play) and magic show to enrich the understanding of the people on the issue of increasing plastic pollution in the Holy River Ganga and make it entertaining at the same time. Signature and pledge campaigns as well as rallies were also conducted to spread the message to a larger audience.

### 4.2.1. In Haridwar

Following are the Run up events which were organised in Haridwar from 9-11 February 2020 as a part of a large campaign which led to the Mega Event on 11 February 2020 at Haridwar:

#### ✓ Signature and Pledge Campaign

This activity was conducted by Development Alternatives and Adarsh Yuva Samiti representatives at Har Ki Paudi, Haridwar on 9 February, 2020. Pilgrims and tourists were made aware of the problem of plastic in Ganga and how it affects human life and the ecosystem. Around 1500 people signed on a white cloth and pledged for plastic free Ganga.

#### ✓ Street Play

This activity was conducted by Development Alternatives and Adarsh Yuva Samiti (AYUS) representatives at Moti Bazar Haridwar, on 10 February 2020 with the help of a local street play performing group. The aim of the street play was to create awareness for shopkeepers, local community and tourist on plastic free Ganga through an entertaining medium. Nearly 500-600 people were present during the street play.

#### ✓ Rally

A rally was conducted by Development Alternatives and Adarsh Yuva Samiti (AYUS) representatives on 11 February from Visnu Ghat to Harki Podi, near Ghantaghar area by Uppar road. More than 800 volunteers participated in this rally from different NGOs, departments and institutions. This rally travelled through key areas such as markets and ghats so that the message of not littering plastic in river Ganga could reach.



Figure 8: Run-up events held in Haridwar before the Mega event

#### 4.2.2. In Prayagraj

Following are the Run up events which were organised in Prayagraj from 22-24 February 2020 as a part of a large campaign which led to the Mega Event on 25 February 2020 at Prayagraj:

##### ✓ Nukkad natak (Street play)

Two Nukkad Nataks were done by Nukkad Natya Abhiyana Santhan. The topics of the play ranged from how plastic has entered each and every parts of our life and its negative consequences. The play also showcased various ways such as use of cloth bags as an alternative to plastic bags. The Nukkad Natak was organised at Sangam Zone on 22 February 2020 and one near Hanuman Mandir on 24 February 2020. The SWARG Volunteers mobilised the pilgrims and other people for Nukkad Natak to build knowledge and awareness on plastic free Ganga.

Around 400 people watched each show of the Nukad Nataks organised at Sangam Zone. At the end of each nukkad natak a pledge was taken by people to stop littering plastic in river Ganga. The group which performed the play was a part of Nukkad Natya Abhiyana Santhan which is an established street play group that has participated in several government initiatives related to plastic pollution and Ganga river pollution.

##### ✓ Magic show

A magic Show was organised on 23 February 2020 at Sangam Zone to build awareness among the community and pilgrims on reducing the use of plastic. The magic show, emphasised the role of common man to prevent the plastic going to river Ganga or any other river. The show also motivated the audiences to think twice before using the plastic and slowly start taking measures for reducing the use of single use plastic.

During the show the magician demonstrated the alternatives of plastic by showing cloth made bags through magic and urged people to play their part in reducing the use of plastic. The magician and the artists involved the audiences in their respective acts for greater sensitization of the people on the issue of plastic free Ganga. The Magic Show was viewed by 200 pilgrims and people near Sangam Zone.

At the end of the show pledge was taken to reduce the use of plastic and personal commitment for not throwing the plastic in river Ganga or any other water body.

### 4.3. Mega event

As a part of awareness strategy one Mega Event in each city was conducted to bring diverse group of people on single platform to talk about the marine plastic pollution in the Holy river Ganga. Speakers from different backgrounds were invited to spread awareness among people regarding the big menace of plastic litter in the Ganga river. These speakers included religious leader, expert from academia, local CSO's who are already working on the same cause, and administrative officials who work for clean Ganga.

#### 4.3.1. Mega event in Haridwar

Under the theme – '*Humara Sankalp Plastic Mukta Ganga*', a mega event was organised in Haridwar on 11 February, 2020. The major aim of the event, was to build a common platform for diverse stakeholder to share their opinions and thoughts on the issue.

The event was organised at Ghanta Ghar area opposite to Har Ki Paudi and was supported by Ganga Sabha.

The mega event helped to spread the word to a larger audience by involving religious leaders, members of Ganga Sabha, members from local administration and other CSO partners. This joint effort facilitated in reducing the current rate of dumping plastics into the river Ganga.

The main chef guest for the event was a renowned faith leader, Kailashanand Ji from Agni Akhada who highlighted upon the change in individual's greed and habit leading to plastic pollution in the river.

Other guests included, Ms. Arushi Nishank, promoter of Sparsh Ganga initiative in Haridwar and working on cleaning Ganga for many years and is involved in various related forums. Another distinct guests in the event were:

- Professor VD Joshi – Retired professor and a social activist in the field of environment. He scientifically explained the carrying capacity of the river, beyond which it will be difficult to save the river.

- Ganga Sabha – Both President and Secretary were present in the event. They pledged for taking new initiatives of protecting the river from plastic pollution.
- Upper Mela Adhikaari from District Administration who pondered on the initiatives taken by administration to protect the river.
- Saloni Goel from UNEP acknowledged the efforts taken in this line and highlighted upon the harmful impacts of the river.

**Highlights of the event:**

- The event started with a rally by more than 600 volunteers, chanting slogans of removing plastics from one’s life. The rally covered a distance of two km, crossing major populated spaces in Haridwar.
- Speeches by distinct guests was followed by pledge ceremony, where more than 2000 people took pledge. This instilled a feeling and emotion of making the sacred river plastic free.
- The event was finished by Ganga Aarti, to reaffirm this sentiment and firming our responsibility to reduce plastic.
- Signature campaign from run-up events was followed in mega event too. More than 3000 signatures were collected.
- Outreach video and jingles were played on LED screen and speakers throughout the event.



**Figure 9: Glimpses from Mega event held in Haridwar**

**4.3.2. Mega event in Prayagraj**

Mega Event with theme – *“Humara Sankalp Plastic Mukta Ganga”* was organised on 25 February at the Sangam area. The major objective of the event was to bring different stakeholders with diverse professional backgrounds together to discuss and deliberate about the urgency and importance of conserving the river, finding the alternatives of single use plastic and total management of plastic waste by recycling it in the best way possible.

**The main guests for the event were:**

- Religious leaders – There were two renowned and acclaimed religious leaders
- President of Navik management committee
- Scientist from Ministry of Environment and Forest
- Professor of Environment from Prayagraj University
- Zonal Officer from Municipal Corporation

- Director of MSME
- Medical Officer from Sanitation Department
- Many social activists
- Saloni Goel from UNEP

There were more than 400 participants from different target audiences that were reached out through different campaigns and awareness activities.

There were cultural programmes to reinforce the message of plastic free Ganga. Stakeholders were felicitated for their sheer efforts in combating plastic pollution over the years. The event ended by a pledge taking ceremony followed by Ganga Aarti.

#### Highlights of the event:

- The paintings and drawings made on the issue and measures to control marine plastic by the students of the two schools – Royal House Public School and Bal Kalyan Kendra in Daraganj were displayed at the event site. The children also displayed beautifully crafted utility items developed by them using the used plastic bottle, polythene etc. which gave the message of recycling from plastic.
- Magic Show was organised to disseminate the best practices towards the reduction of Single Use Plastic which will ultimately maintain the purity of the Holy river Ganga. The Magician involved the audiences especially the children and promoted the message of clean Ganga amongst the audience.
- A key message was delivered by the Chief Guest Shri Ram Das Maharaj. While addressing the audience he linked the menace of plastic to terrorism and urged everyone to take it as their own responsibility and duty to reduce the plastic pollution in river Ganga and make it the sign of purity.
- Different stakeholders while addressing the audience involved them by making the speech interactiv. They asked them about their views on the issue of plastic pollution in Ganga river. They also discussed measures to reduce plastic by using alternatives such as cloth and paper bags for daily use, recycling the plastic boxes and bottles and segregating waste at homes. The message was given to all that this step of cleaning Ganga should be a step taken by all.
- The major highlight of the programmes was the handling of 1500 PET bottles to the Zonal Officer, Municipal Cooperation, Prayagraj collected during Magh Mela in Prayagraj by the Swchhagrahis and Safai karamcharis under the jurisdiction of Dr. Tyagi, Medical Officer, Prayagraj.





Figure 10: Glimpses from the Mega event held in Prayagraj

#### 4.4. Outreach material

To generate awareness and a feeling of responsibility to keep the Holy River Ganga clean it was essential to develop that thought amongst people. For this, several outreach materials were developed to reach to the mass population of both the cities directly or indirectly. These outreach materials were developed to create a strong impact on people’s mind to reduce the consumption of plastic and why it should not be thrown in the river. Following are some of the outreach material developed for mass communication in both the cities:

**Table 6: Types of outreach material**

S. No.	Type of outreach material	Haridwar	Prayagraj	Total outreach number for both cities
1.	<p><b>Video</b></p> <p><a href="https://drive.google.com/drive/folders/1KZf8xD_eCEoFfdity2ZJ1g_DYF2A1UuDfj">https://drive.google.com/drive/folders/1KZf8xD_eCEoFfdity2ZJ1g_DYF2A1UuDfj</a></p>	 <p>The video is being played at <i>Harki Podi</i> in Haridwar one one LED screen everyday which is reached to approximately 20000-30000 visitors every day. And the video will be played during coming <b>Kumbh Mela</b> in Haridwar which will be directly reached to more than a crore of people.</p>	<p>This outreach video is being played on 50-53 LED screens covering the area of Sangam Zone and Civil Lines. It will impact approximately 300-500 people. The running frequency for the video will be once a week.</p>	30,500 people
2.	<p><b>Radio program</b></p>	<p>To reach out people who are at homes and indoors to spread the message of clean and plastic free Ganga and how contribution of each individual will create a difference. Approximately 1,170,000 people are reached out through the radio channel AIR from the station Dehradun in 6 districts which are Dehradun, Haridwar, New Tehri, Uttar Kashi, Rudra Prayag and Chamauli.</p> 	<p>To reach out people who are at homes and indoors to spread the message of clean and plastic free Ganga and how contribution of each individual will create a difference. Approximately 11,250,000 people are reached out through the radio channel AIR from the station Prayagraj in 6 districts which are Prayagraj, Pratapgarh, Mirzapur, Banda, Kaushambi and Chitrakoot.</p>	12,420,000 <b>(the radio program has been played twice on both the stations i.e. Dehradun and Prayagraj)</b>

3.	<b>Jingles</b> <a href="https://drive.google.com/drive/folders/1WIH44-raiJPCy8sKjrXcalVP843pwXlj">https://drive.google.com/drive/folders/1WIH44-raiJPCy8sKjrXcalVP843pwXlj</a>	<p>The jingles are a great source of awareness regarding plastic pollution in the Holy River Ganga. It is being played at <i>Harki Podi</i> in Haridwar and also through radio program and impacted 1,170,000 people. It will be played during <b>Kumbh Mela</b> in Haridwar which will impact a greater bunch of visitors taking the number to a crore or more.</p>	<p>Jingles played a major role in reaching out to people near and far to spread awareness regarding plastic pollution in the river Ganga and how people can make the river clean. It is played at Sangam Zone and through the radio program which has impacted approximately 11,250,000 people.</p>	<p>12,420,000  <b>(the jingles have been played thrice a day for seven days in both the cities i.e. Haridwar and Prayagraj)</b></p>
4.	<b>Others (Brochure &amp; Leaflet)</b> <a href="https://drive.google.com/drive/folders/1U2kwdSgZyY--Xeusn2LtmJ7RWcctA8G">https://drive.google.com/drive/folders/1U2kwdSgZyY--Xeusn2LtmJ7RWcctA8G</a>	<p>Brochures and leaflets are the outreach material for the program in the form of hardcopy which incorporates information on how the river Ganga plays an essential role in the life of every person and it is our responsibility to keep it clean and healthy. These are distributed to various stakeholders such as District Administration, Religious leaders, Shopkeepers, School children and residential areas. And also, to the visitors at <i>Harki Podi</i> during the events that are conducted. It has directly created impact on more than 15000 people.</p>	<p>These hardcopy outreach materials are being circulated to different stakeholders and during various outreach activities conducted such as Nukkad Natak, Mega event, Clean-up drives. By this people were made aware about the menace of plastic in river Ganga and the urge to keep it clean and free from plastic by being a responsible citizen. More than 20000 people are impacted.</p>	<p>350,000</p>
<b>TOTAL</b>				<b>24,905,500 approx.</b>



# 5

## TRAININGS AND WORKSHOPS

As a part of the awareness generation amongst different stakeholders identified in both the cities trainings were conducted at various levels to spread the message of Plastic Mukta Ganga. It was essential to conduct such training programmes or workshops so that there is better understanding and clarity on the subject. To make people aware about the menace of plastic in river Ganga, it was also important to know their views on the same. Therefore, several BIG sessions were conducted in Haridwar and Prayagraj as a part of awareness generation amongst the target groups.

### 5.1. BIG (Bridging Information Gap) sessions

As a main capacity building programmes in the project, BIG sessions were organised in both the cities. These sessions were 2-3 hours long, where the current knowledge upon the issue was assessed and then an orientation programmes to bridge the information gap with different type of target audience.

#### 5.1.1. BIG session in Haridwar

For Haridwar three target audience were decided as per the survey done in the city, namely, two sessions with school children, one with media and one with shopkeepers. BIG sessions with one school and shopkeepers are planned for the next month. Summary is as below:

**Table 7: Summary of BIG session in Haridwar**

Objective	Target audience	Outreach number
Assessing the current understanding on plastic waste, building upon the gaps in their knowledge	School	170
	Media	32
<b>TOTAL</b>		<b>202</b>

#### ✓ Media

Media workshop was conducted in the first week of January, 2020. Almost 32 media persons participated in this workshop. The major aim of the workshop was orienting the media on the project, its vision and objective. Media, as a medium is extremely important in amplifying the message and reaching out to a wider audience group. Media persons asked various questions related to the mandate, outreach and sustainability of the project. They were distributed media kits, consisting of concept note, leaflet, notepad, cap and batches. This was a part of strategy of reaching out to media group in the beginning of the project so that their presence can be ensured in each of the activities at the ground.

#### ✓ School

As planned, one BIG (Bridging Information Gap) session was conducted in two of the schools of Haridwar, named, Government Upper Primary School, Jamalpur and Sewa Sadan Inter college. Through this orientation and awareness program 170 students (all girls) were reached out. The session took place with an objective to build knowledge and create awareness among the school children on the menace of plastic in the Holy River Ganga which ultimately leads to huge marine plastic pollution all over the world. During the session, students were made aware about the types of plastic thrown in rivers, its impact and how to reduce the use of plastic to minimum. For this, various videos were shown and to make the session interactive a quiz on plastic pollution was also played with students. Students were very enthusiastic and curious throughout the session and were able to understand the problem of plastic in rivers. A creative activity was planned for students called as DIY (Do It Yourself) in which a video was shown to them which talked about how we can use plastic items by recycling them. Students were aware of such things and they pledged to practice this method in their day-to-day life to reduce the plastic pollution. The efforts were also made with the principal and teachers of the school to establish an Eco Club with 7-10 students.



Figure 11: BIG session with media and school children in Haridwar

### 5.1.2. BIG session in Prayagraj

In Prayagraj, total 7 BIG sessions have been organised so far through which a total number of 1395 of people are impacted directly. The details are as below:

Objective	Target audience	Outreach number
Accessing the current understanding on plastic waste, building upon the gaps in their knowledge	Schools	141
	Religious leaders	917 (10 ashrams, 10 their leaders and 907 followers)
	Swachhagrahis	240
	Naviks	40, including their head
	Sanitation Workers	12 Team leaders
	Media	29
	Shopkeepers	55
	<b>TOTAL</b>	<b>1395</b>

Table 8: Summary of BIG session in Prayagraj

#### ✓ Schools

As planned, one BIG session was conducted in a public school i.e. Royal House Public School, Daraganj, Prayagraj on 5 Feb 2020. The purpose of the session was knowledge building of the children through various creative and participatory activities on plastic, types of plastic, plastic litters.

The module for the entire session was prepared by DA, where a major focus was on using ICT tool to orient the students. There were sessions on spreading awareness on minimising the use of single use plastic and taking steps at individual level to combat them. There were DIY sessions, where students were shown creative methods of using plastic materials to be converted into beautiful decorative items. At the end of session, there was a drawing completion, where students were encouraged to paint their message on saving the environment and Ganga from the impacts of plastic pollution. There was use of audio-visual means for making it infotainment like activity so that the sessions are entertaining and at the same time understandable. Total 102 number of children from 6 to 8 Class, 4 teachers, pledge taking with the children was done for which facilitation from the team members was ensured. Similar activity was conducted on 14 February 2020, in a government school, Bal Kalyan High School situated in Daraganj, Prayagraj. Thus, two schools, each of private and public sector were reached.



### ✓ Swachhagrahis

Swachhagrahi are awareness creation group, they are appointed on duty during the Kumbh and Magh Mela, religious events around the river Ganga. They stay in the mela for around 30 days spreading the message of cleanliness and proper sanitation. They visit different sectors of the Magh Mela and spread the message of proper disposal of waste and also maintenance of hygiene during the magh mela. An orientation of around 250 Swachhagrahis in the Magh Mela was undertaken under the programmes. The main discussion with them pertained to the topic of plastic pollution. There was an assessment of their basic understanding on plastics as a problem. The problem of plastics reaching the oceans through rivers and its impacts on the marine ecosystems was discussed with them.

The objective of the orientation was to amplify the message on the issue of plastic pollution. The activity was conducted to ensure the reach to maximum number of pilgrims via the Swachhagrahis. It also has a wider impact, as most of the Swachhagrahis are from nearby villages, hence they are able to spread the message in their native villages.

### ✓ Religious leaders

The orientation of the Religious Leaders belonging to different Pandals/Religious Institution was carried out on different days from 1 to 7 February 2020 during Magh Mela. The purpose of this was incorporation of the Plastic Free River message in daily preaching and prayers.

The religious leaders read out key messages to their thousands of followers daily and also acknowledged the efforts taken up by DA. Their followers understood the harmful effect of single use plastic on the rivers, aquatic lives and ultimately its reversal effect upon human being as well. The pamphlets were distributed among the followers that were pilgrims to reinforce the key message.

**Table 9: Summary of Religious leaders involved in BIG session**

S. No.	Name of Religious Institution/Entity/Pandal	Name of the Functionary/Head of the Religious Institution	No. of Pilgrims/ Bhakts reached
1.	Awadhut Bhagwan Seva Ashram, Mumbai	Sri Alakh Ram Ji	25
2.	Lav Kush Seva Ashram, Ayodhya	Acharya Gorakhnath Shastri	104
3.	Akhil Bhartiya Panch Karma Mandir, Kanpur	Acharya Hari Narayan Tripathi	80
4.	Karmayog, Bhadohi	Acharya Chandan Shastri Ji Maharaj	80
5.	Saket Dham, Ayodhya	Acharya Madho Madhukar Ji	60
6.	Hari Divya Sadhna Peeth, Pratapgarh	Sri Mukund Ji	123
7.	Siddheshwar Madhaw Dham, Karnal-Hariyana	Sri Sankarashram Ji	93
8.	Madhusudan Math, Varanasi	Acharya Krishnanand Ji	85
9.	Jaishri Nageswar Dham, Kurukshetra-Hariyana	Acharya Sri Maheshwara Nand Ji Maharaj	107
10.	Param Hans Ashram Tulasi Baba, Mirzapur	Sri Argadanand Ji	150
<b>TOTAL</b>			<b>907</b>

### ✓ Shopkeepers

BIG Session with the Shop Keepers was carried out on 6 February 2020. This was done in Interpersonal Communication (IPC) mode. The shop keepers nearby Sangam were consulted and oriented on the project's key messages and it was asked to tell their customers not to demand Single Use plastic and not to throw the same in river after using it. The pamphlet given to them was supportive in knowing the key facts on the plastic pollution and seeking their support in our efforts. Total 55 shopkeepers were reached by the team members.

### ✓ Navik (Local boatman)

Regarding Naviks, a one of the most important community in Prayagraj, the key message of not using single-use plastic was read out to them through an orientation program. They were reached out through the President of Navik Management Committee. There were sharing where Naviks highlighted the ways in which plastic is thrown into the river by pilgrims. According to them, the parshaad (sacred offerings) carried by pilgrims, the chips packets, PET bottles and the packets of food for feeding birds; are some of the common plastics that are thrown into the river.

At the end of the orientation workshop, everyone pledged to not throw plastic into the river and also urging pilgrims and tourists following the same. Total 40 Naviks were present in the orientation workshop.



Figure 12: BIG sessions conducted with Naviks, school students, shopkeepers, sanitation workers, religious leaders and Swachhagrahis

# 6

## MEDIA OUTREACH

As a part of strategy, both traditional and social media was used in both the cities to disseminate the information and key messages.

### 6.1. Social Media Coverage

As per the strategy, the social media coverage is planned under three parts:

- Introduction to the issue
- Call to Action
- Connecting to Alternatives

Under these parts, different posts were shared. There was a specific template designed to ensure symmetry of all the posts. Initially the posts were related to the information on the issue. There were three posts shared under this part. Currently, the updates and posts on outreach activities are shared under the second part, i.e. Call to Action. Presently, 17 such posts have been shared.

Two weekly posts were shared on Facebook, twitter and Instagram handles of Development Alternatives. Right hashtags were used in all the posts shared.

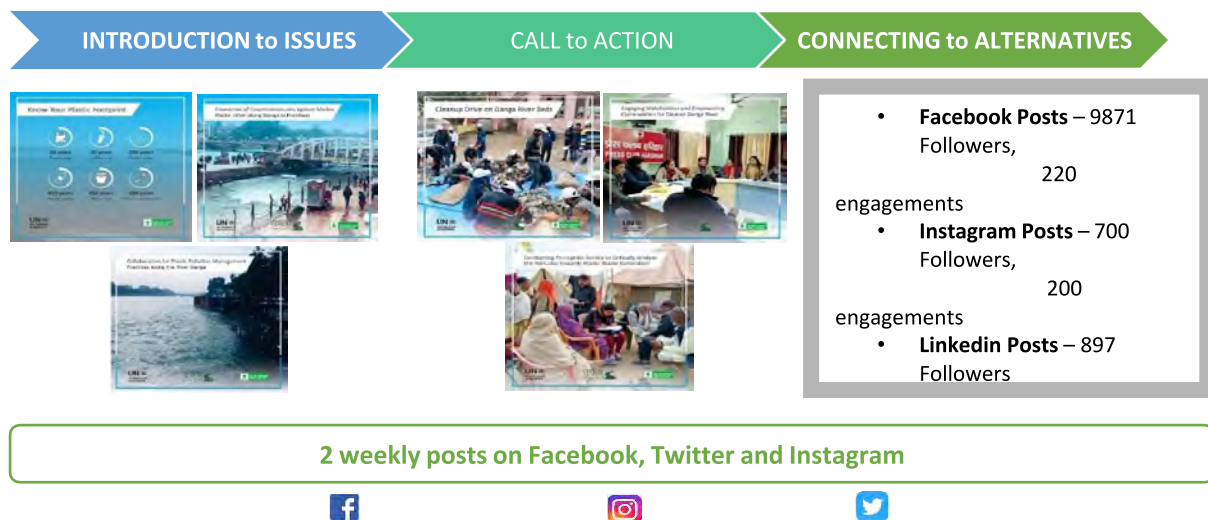

















Figure 13: Glimpses of social media coverage

Table 10: No. of posts shared and corresponding activities on social media platform

Social media platform	Total number of posts shared	Activities covered
Facebook	13 posts	Perception survey, clean-up drive, BIG sessions with different stakeholders and Mega event
LinkedIn	13 posts	Perception survey, clean-up drive, BIG sessions with different stakeholders and Mega event
Instagram	13 posts	Perception survey, clean-up drive, BIG sessions with different stakeholders and Mega event
Twitter	17 posts	Perception survey, clean-up drive, BIG sessions with different stakeholders and Mega event

**Table 11: Total outreach through two social media platforms – Instagram and facebook**

Post	Type of Post	Instagram Reach	Facebook Reach
	Awareness Generation	473	876
	Post Event	341	556
	Post Event	387	676
	Pre-Event	340	353
	Post Event	408	540
	Awareness Generation	375	716
	Post Event	354	555

	Post Event	328	980
	Post Event	389	904
	Post Event	348	811
	Awareness Generation	420	1.3k
	Post Event	354	903
	Post Event	368	524
	Post Event	373	733
	Pre-Event	340	400
<b>TOTAL</b>		<b>5598</b>	<b>9527</b>

## 6.2. Traditional/Print media

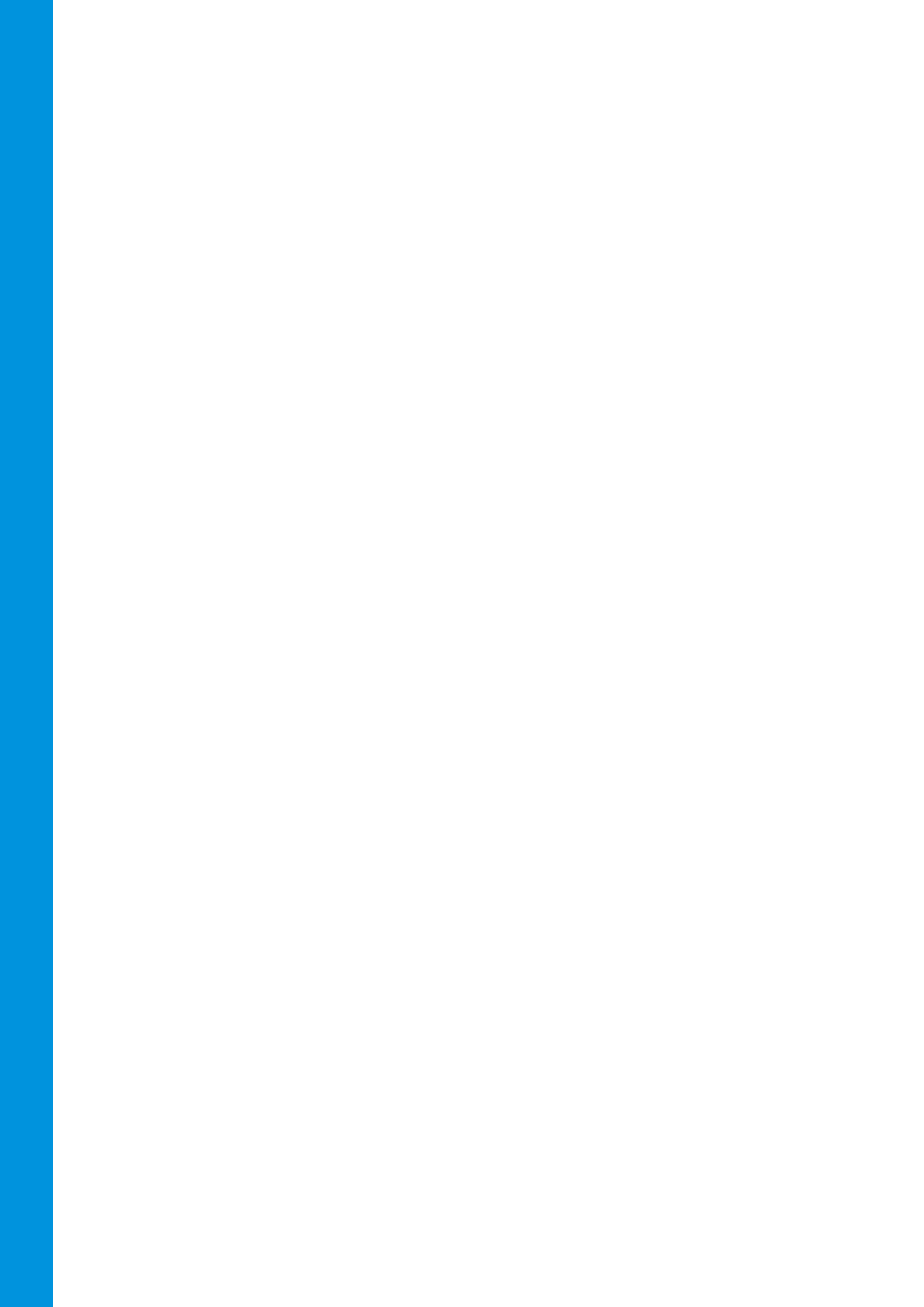
An orientation workshop with media personnels in both the cities was conducted right in the beginning of the project. This ensured more than 35 traditional media (both electronic and print) in a very short duration of time frame. The details are as below:

Traditional media platform	City	Name of the newspaper	Activities covered	Circulation per day
Newspaper	HARIDWAR	Hindustan	Stakeholder meeting, Mega event	10000
		Dainik Hak	1 <sup>st</sup> Clean-up drive	10000
		Dainik Jagran	Stakeholder meeting, Mega event	20000
		Bhaskar Samachar Seva	Media orientation workshop	15000
		Hindustan Times	1 <sup>st</sup> Clean-up drive	25000
		Dainik Dak Seva	1 <sup>st</sup> Clean-up drive	10000
		Uttarakhand News	2 <sup>nd</sup> Clean-up drive	20000
		Shah Time News	Mega event	10000
		Swatantra Chetna (Newspaper for P2P news blog)	Media orientation workshop	10000
	PRAYAGRAJ	Amar Ujala	1 <sup>st</sup> Clean-up drive, Nukkad Natak, Mega Event, 2 <sup>nd</sup> Clean-up drive	179731
		Hindustan	1 <sup>st</sup> Clean-up drive, Mega Event	22082
		Awadhnama	Media orientation workshop	75000
		AAJ	Media orientation workshop, 2 <sup>nd</sup> Clean-up drive	54011
		Swatantra Chetna	Nukkad Natak, 2 <sup>nd</sup> Clean-up drive	36000
		Dainik Jagran	Nukkad Natak, Mega Event	344682
			Rashtriya Sahara	Nukkad Natak, 2 <sup>nd</sup> Clean-up drive
Chetna Vichar Dhara			Nukkad Natak	
Nyay Deesh			Mega Event	185900
iNEXT			Mega Event	
Hindustan Times			2 <sup>nd</sup> Clean-up drive,	234765
Times of India			2 <sup>nd</sup> Clean-up drive	187887
		Swatantra Bharat	2 <sup>nd</sup> Clean-up drive	35000
<b>TOTAL</b>				<b>1597549</b>

	Haridwar	Pryagraj
Social and Behavioural	<ul style="list-style-type: none"> <li>The major plastic leakage is through the influx of pilgrim and tourist population, which increases during the time of major event</li> <li>Religious practices such as leaving clothes, plastic cans, the packaging of parshad in the river, etc leads to plastic pollution. Involving religious leaders in this</li> </ul>	<ul style="list-style-type: none"> <li>Major source of plastic pollution – households, slums, floating population</li> <li>Major events at the Sangam such as Magh Mela and Kumbh, results in influx of crores of pilgrims, adding to the marine plastic pollution</li> </ul>
	<p>dialogue is very important because they are great influencers</p> <ul style="list-style-type: none"> <li>Initiatives are taken by different stakeholders – Ganga Sabha – daily pledge before Arti of maintain the purity and sanctity of the river, initiatives by CSOs- Installing 4 different colour of dustbins (different for throwing clothes, puja samagri, plastic and other) at some Ghats which they call Kalash. But not a coordinated effort</li> <li>We found that shopkeepers were ready to shift to alternatives which were cost effective</li> <li>People were generally aware that one should not use plastic, but its lifecycle and extent of impact on marine ecosystem, environment and humans was not clear</li> </ul>	<ul style="list-style-type: none"> <li>Naviks pointed out that the plastic used for packaging of feed for Siberian crane is thrown by the visitors into the river during boat rides</li> </ul>
Infrastructure design and implementation	<ul style="list-style-type: none"> <li>At prime locations installation of more dustbins at a distance of 50 m needs to be ensured by Nagar Nigam</li> <li>Source segregation only happening in some RWAs. The waste collection fleet does not support this source segregation. The entire waste reaches their Sarai plant</li> <li>There are few major hotspot areas where the maximum plastic waste is being produced – market place near Har Ki Paudi and Har Ki Paudi, where the collection was not happening on daily basis resulting in over flowing of dustbins</li> </ul>	<ul style="list-style-type: none"> <li>During clean up drives, it was found that 40 percent of waste collected was plastic. Multi-layer packets for food, tobacco, etc was the dominant form of plastic that was being collected</li> <li>Like in Haridwar, there is no proper system for plastic waste disposal or recycling. The entire waste is sent to the Banswar plant</li> </ul>
Systemic and structural issues	<ul style="list-style-type: none"> <li>Apart from some MLP which is sent to cement kiln, no value chain to dispose or recycle other forms of plastic. Some of the saleable plastic is picked up by the rag pickers at transverse station, rest everything is dumped into the Sarai plant. Incentivising other forms of plastic and bringing the ragpickers back into the value chain can solve a problem to certain extent</li> <li>Lot of slum areas (one in which we also carried our Perception Survey) are located right at the banks of main river or drains that end up in main river. These areas currently are not listed under Nagar Nigam’s jurisdiction, hence there is no waste collection system. All the waste produced ends up in the river</li> <li>More than 60 percent of the waste collected in both clean up drives was plastic</li> </ul>	<ul style="list-style-type: none"> <li>Contract for solid waste management is given to a private company that does not ensure 100 percent waste collection, as was very evident when we visited hotspot areas, the streets and major drains were littered with plastic (common for both the cities, In Haridwar it is given to KRL and in Prayagraj it is given to Hari Bhari). Lack of critical evaluation of the effectiveness of services provided by private contractors and mandatory resource recovery</li> <li>Nagar Nigam themselves have recognized 203 hotspots in the city. Out of which they have managed to clean 69</li> <li>No strict penalties/ fines for littering from institutions along the river (this is common for both the cities)</li> </ul>

Social and Behavioural aspects	<p>STAKEHOLDERS:</p> <ul style="list-style-type: none"> <li>Pilgrim and tourist populations are major generators therefore those who link to this population religious leaders / priests/ naviks/shopkeepers selling prasad etc. must be the targets of training and carriers and repeaters of the message.</li> </ul> <p>MESSAGE &amp; MODE:</p> <ul style="list-style-type: none"> <li>All that is given to the river as part of the ceremonies is becoming “plastic / part plastic) clothes, Prasad packaging etc. therefore a campaign to “go natural for nature” needs to be now promoted</li> <li>Awareness must be coupled with how this is effecting HEALTH. Health is big concern, especially after the current pandemic and this must be used to make people understand that their health is not distinct from the health of the river and oceans. “I am the river; the river is me”</li> <li>Learning by doing works very well, so schools, RWAs, Pilgrim efforts etc. in participating in regular clean-ups, Swachta Audits etc. should be part of curricula, SUPW, activities etc</li> <li>Municipality +CSO + faith based leaders led promotion of alternatives in the area</li> <li>Working extensively with faith-based leaders to disseminate the message</li> </ul> <p>CONSUMER BEHAVIOUR SHIFTS</p> <ul style="list-style-type: none"> <li>Solutions at end of pipe for management and beginning of pipe for reduction are available and people are positively inclined, these need to be made affordable and accessible</li> </ul>
Infrastructure design and implementation	<p>COLLECTION INFRASTRUCTURE DESIGN AND LOCATION:</p> <ul style="list-style-type: none"> <li>Must be related to urban and pilgrim behaviours (size, colour, location, distance, easy cleaning)</li> <li>Source segregation requires             <ul style="list-style-type: none"> <li>collection infrastructure (vehicles) to be suitably designed and</li> <li>bailing, composting infrastructure points and set-up</li> </ul> </li> </ul> <p>Hence, systems to be made supporting the source segregations</p> <ul style="list-style-type: none"> <li>Collection tracking is required and IT systems would be very useful here</li> <li>Decentralised segregation/ management sites required</li> <li>Installation of dustbins at 50 m, in prime locations and also ensuring regular waste collection, to avoid over-flowing</li> <li>Informal waste collectors to be included in the system to recover maximum resources during collection</li> <li>Collection system to be connected to CSOs making products out of waste material</li> </ul>
Systemic and structural issues	<p>TECHNICAL R&amp;D:</p> <ul style="list-style-type: none"> <li>Innovative solutions for are required. At this stage only incineration is the s MLP and plastic to oil solution in cement plants. New research with respect microbial action on MLP need to be explored. – aside from the traditional spaces</li> </ul> <p>MANAGEMENT SYSTEMS AND RULES:</p> <ul style="list-style-type: none"> <li>Waste transportation rules need to be changed from weight to volume base – this will encourage source segregation and also make business sense for light weight plastic waste movement for recycling.</li> <li>Informal settlements must be addressed in urban services so that slums and squatter settlements do not become hot- spots.</li> <li>Higher fines on littering and open dumping</li> </ul> <p>COLLABORATIVE MODELS AND PROCUREMENT SYSTEMS:</p> <ul style="list-style-type: none"> <li>Decentralization and collaboration are keys to management – and local solutions for management through enterprises must be fostered. This will require different forms of tenders and service contracts.</li> </ul>
	<ul style="list-style-type: none"> <li>Similarly, public procurement and procurement support for small producers of alternatives to single use plastic are necessary. (just the way LED shift was made in street lights and in home lighting)</li> <li>Partnerships and platforms of municipalities, civil society and small businesses to act together and tract together</li> </ul>





## About Development Alternatives

Development Alternatives (DA) is a premier social enterprise with a global presence in the fields of green economic development, social equity and environmental management. It is credited with numerous technology and delivery system innovations that help create sustainable livelihoods in the developing world. DA focuses on empowering communities through strengthening people's institutions and facilitating their access to basic needs; enabling economic opportunities through skill development for green jobs and enterprise creation; and promoting low carbon pathways for development through natural resource management models and clean technology solutions.



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