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Overview

The international theme of World Environment Day 2018 was “Beat Plastic Pollution”. True to this theme, during the year under review Green Hills demonstrated the feasibility of segregation at source, door-to-door collection of plastic waste and its use in road construction. By the end of the service contract with the Swiss Agency for Development and Cooperation (SDC) in December 2018, almost ten tonnes of plastic waste had been collected from Almora town and Cantt and used by the PWD and PMGSY to construct 5 kilometres of road, which reportedly remain in excellent condition. The collection and its use in road construction have been documented in a video called “Better roads with plastic waste” available on You Tube <https://www.youtube.com/watch?v=u-3g1VDzjuY&t=113s>. It was hoped that the newly elected Nagar Palika would continue the collection of plastic waste when the project ended, since 50 to 60% of households were segregating it, but no effort was made to get the sanitation staff to take it over.

The celebration of World Environment Day itself showed the results of awareness raising done by Green Hills with the teachers and students of six high schools. Each school put up a play on plastic pollution through which many innovative solutions to the problem were proposed. The Almora Utsav attended by thousands of people was also an occasion to propagate the use of cloth bags in place of plastic carry bags.

In the hope of replicating the success in Cantt in applying the Solid Waste Management Rules, 2016, Green Hills responded to the call for tenders in October 2018 to equip the ‘trenching ground’ in Baldoti with machinery for recycling and composting. The contract was however awarded to a company from Rishikesh that did not include source segregation and door-to-door collection in its *modus operandi*.

Seeing that most of the waste dumped in the trenching ground formed a ‘smoky mountain’ on the outskirts of Almora, Green Hills used the Right to Information Act and interviewed residents on video to get the Nagar Palika to address the problem of pollution. The video was screened privately for the local authorities and resulted in an agreement for Green Hills supervisors to work together with the Nagar Palika staff on source segregation, door-to-door collection and recycling.

The research on nutritional qualities of stinging nettle continued with samples being picked up from different parts of Kumaon and tested for their content. The results of this research have been shared in several scientific conferences and in specialised publications.

Awareness raising

The World Environment Day on the theme “Beat Plastic Pollution” was the occasion for involving students in reflecting on the theme, writing scripts for plays and performing them at the Uday Shankar Auditorium on June 3. Teachers were briefed well in advance of the occasion and given educational materials on the theme for use in their classrooms. Six high schools performed plays before a public of about 300 people in the presence of the MLA, Mr. Raghunath Singh Chauhan and the Sub-District Magistrate, Mr. Vivek Rai, who was then in charge of the Nagar Palika until the next election.



Special guests and participants were presented with a cloth shopping bag carrying the logo of Green Hills and of the SDC with the message *plastic hatao, parayavaran bachao*. The event was extensively covered by the media.

A stand was erected at the Almora Utsav in October 2018 – a big cultural event taking place over three days. The cloth bags were on sale there too.

However, the most important means of awareness-raising were the constant announcements made on the public address systems while walking through the wards to collect plastic waste door-to-door. In addition, the press conferences and advertisements in newspapers carrying the collection schedule were a constant reminder for the public to segregate their waste.

At the end of the SDC service contract, a video called “Better roads with plastic waste” was posted on You Tube (<https://www.youtube.com/watch?v=u-3g1VDzjuY&t=113s>) and screened on several occasions.

Waste Collection

By April 2018, a team of seven persons – one supervisor and six waste collectors were covering all eleven wards of Almora and the villages of Golna Karedia, Sikuda and Dugal Khola. About 60% of households were keeping plastic waste separately and handing it over to the Green Hills waste collectors. The waste was transported by motorcycle to the store

rooms provided by the Nagar Palika and weighed each day. The supervisor, Mr. Bhupendra Waldia did an excellent job of motivating the team and making public announcements asking people to bring their plastic waste out.



The following graph shows the evolution in quantities collected since the start of plastic waste collection:



To prepare the waste for use in road construction, laminates of plastic and aluminium used for snack packaging, had to be removed. These were later sold to a *kabadi* and sent for recycling elsewhere. All together ten tonnes of plastic waste were collected during the project period and handed over to the PWD and PMGSY for use in road construction. There was thus a significant reduction in the quantities of plastic waste from Almora town that were being dumped and burned.

Use in road construction

In February – March 2018 the PWD took delivery of two truckloads of plastic waste that included waste that had been collected by Almora Cantt sanitation staff under a previous

initiative of Green Hills. The PWD did not want to invest in a shredder without a trial in Almora. Hence the waste had to be sent to the plastic recycling factory in Kathgodam for further sorting, washing and shredding. According to the Chief Engineer, the transport and processing cost the PWD Rs. 68 per kilo of waste, making the operation uneconomical.

Engineer Manoj Kumar Pande took the initiative of using the plastic waste in repairing the Bijoria-Pachisi road near Kausani. The first attempt failed because the plastic was not shredded finely enough, and the temperature of the gravel could not be controlled as it was being heated directly over an open fire. The second attempt on Bijoria-Pachisi and the Pilkha-Patiya road (2 kilometres in all) was successful. Both these were done in the presence of the Green Hills team and filmed by Mr. Louk Vreeswijk¹. PWD Ranikhet took delivery of 1.9 tons in two batches and used it successfully in constructing the Balti-Vinayak road and the Soni-Titalikhet road in Chamadkhan.

We met with the Chief Engineer of the PMGSY, Mr. Ayaz Ahmed, who showed interest in the environmental impact of our programme. Under his direction, 500 quintals have been delivered to PMGSY Almora and used to build 3 kilometres of the Chaukuni-Dugada road.

All these roads are reported to be in better condition than roads built with hot mix without plastic. In order to render the use of plastic waste in road construction economical, Green Hills has proposed to set up a small plastic waste recycling unit in the district.

Scope for replication of Green Hills experience in Cantt

In October 2018, the Nagar Palika issued a call for tenders to equip the Baldoti trenching ground with bio-composters and other equipment to recycle municipal waste. Green Hills took pains to find appropriate suppliers and submitted tenders for equipment as well as for operation of the site for one year. It was hoped that the work on segregation at source and door-to-door collection would continue if Green Hills was awarded these contracts. Unfortunately, the turnover of the association was judged insufficient for this and the contracts were given to a company from Rishikesh called “Zero waste” that did not wish to invest in source segregation. The capacity for treating the 7 tonnes of waste collected daily by the Nagar Palika is insufficient and most of it is dumped and burned in the Baldoti forest. In March 2019, Green Hills made an application under the Right to Information Act to determine the extent to which the Solid Waste Management Rules of the government were being respected. The responses given by the municipality were then tested through a series of interviews with local people. It was found that no segregation or door-to-door collection was taking place. A video called “Reality Check” was made and screened privately for the local authorities. As a result, an agreement was made with the Nagar Palika for Green Hills supervisors to work with the *safai karmcharis* to pick up segregated waste and undertake decentralised composting of green waste.

Nettle as an alternative food crop

The research being carried out by Dr. Vasudha Pant on the nutritional properties of stinging nettle has continued under the IERP fund of the G. P. Pant Institute. This being a plant that is

¹ See « Better roads with plastic waste » <https://youtu.be/u-3g1VDzjuY>

resistant to disease and attacks by monkeys and other wild animals, it is hoped that it will in future become a nutritional complement for mountain people.

The way forward

Green Hills continues to put the expertise acquired under the SDC service contract at the disposal of the Nagar Palika and District authorities. It has decided to extend its services to the villages around Almora by participating in the state Swajal project on liquid and solid waste management. It is also pursuing its work on nettle as an alternative food crop.
