

**SIACHEN GLACIER ECOLOGICAL ISSUES: SWACHH**  
**SIACHEN ABHIYAN (SSA)**

**Generation of Waste in the Glacier**

1. The waste is generated in the region through the stores that are inducted into the Siachen Sector by various transportation means such as air, vehicles, porters and ponies. These loads are essential for operational purposes and for the survival of troops in such harsh conditions. The basic loads being inducted are: -

(a) **Rations**. These include dry, tinned and special rations. These work out to a total of 465 Tons per annum out of which 4.383 Tons (approx) is the packing material.

(b) **Engineer Stores**. A large number of engineer stores like Fiber Glass Huts (FGH), Defence Stores, generator etc that are inducted and have a longer life, remain in serviceable state for considerable period before they turn into waste. Due to their size it becomes difficult and uneconomical to de- induct them from the posts.

(c) **Ordnance Stores**. This would include all type of stores of ordnance origin to include signal stores, tentage etc. All items becoming unserviceable form part of this waste.

(d) **Miscellaneous Stores**. These consist of all other stores that have not been included in any of the above category but are being inducted into the glacier. These would include items of Sector stores and various induction stores carried by newly inducted battalions.

**Types of Wastes**

2. Broadly, waste in the glacier can be categorised as follows: -

- (a) Fiber glass.
- (b) Plastics.
- (c) Fired cases/ Unserviceable (UNSV) ammunition.
- (d) Polythene/ plastic wrappings of various items and pipes.
- (e) Fuel, Oil and Lubricants (FOL) barrels/ Jerricans.
- (f) Tins (tinned and dehydrated rations) and assorted metal items.

- (g) Ladders, route markers, Perforated Steel Plates (PSPs) and other mountaineering equipments.
- (h) Unserviceable FGH, tentage items and utensils.
- (j) Unserviceable/ Beyond Economic Repairs (BER) generators.
- (k) Parts of old snowmobile.
- (l) UNSV personal clothing/ equipment.
- (m) Human waste & kitchen waste.
- (n) Parachutes and Supply Dropping Eqpt (SDE).

3. **Waste Generated in One Year.** The summary of total waste generated in one year (sub sector wise) which is 30 % of the inducted load is as under :-

<b><u>Ser No</u></b>	<b><u>Sub Sector</u></b>	<b><u>Tonnages</u></b>
(a)	Northern Glacier (NG)	154.320
(b)	Central Glacier (CG)	42.185
(c)	Southern Glacier (SG)	15.872
(d)	Sub Sector West (SSW)	10.567
(e)	Sub Sector Haneef (SSH)	10.567
(f)	QRF	3.243
	<b>Total</b>	<b>236.75/ year</b>

### **SSA INITIATIVES**

4. The continued accumulation of waste on the Siachen Glacier was assuming alarming proportions and was slowly affecting the fragile ecology of the area. To achieve this, an action plan for waste reduction and waste disposal was required to be formulated.

5. To put the activities under one umbrella, an initiative named '**Swachh Siachen Abhiyan (SSA)**' has been undertaken by the Army wef February 2018. The Initiative aims at decreasing the waste generation and a gradual and phased extrication of the accumulated waste from Siachen. The action plan and activities undertaken under SSA are enumerated in the succeeding paragraphs.

## Action Plan

6. **Phases of Action Plan.** The action plan was charted out in the phases as given below: -
- (a) **Phase 1.** Sensitisation of troops with respect to identification, collection and classification of waste and the need for the initiative.
  - (b) **Phase 2.**
    - (i) Identification of methods to decrease waste entering the glacier.
    - (ii) Making a consolidated list of such items and identifying methods to introduce environment friendly items.
    - (iii) Use of shredders to dispose waste instead of burning waste in glaciers.
  - (c) **Phase 3.** To identify suitable garbage and waste collection / extrication points.
  - (d) **Phase 4.** Identify methods for disposal of the waste.

## Actions Initiated

7. **Phase 1.**
- (a) **Formulation of Task Force.** To streamline the activities under SSA, two Task Forces were constituted under the overall control of Deputy Commander, Siachen Sector.
  - (b) **Earmarking of Responsibility.**
    - (i) **Task Force Commander.**
      - (aa) Overall planning, control and coordination of activities in respective areas.

(ab) Projection of requirements of resources/stores/ equipment for Siachen Sector.

(ac) Maintenance of record of all activities.

(ii) **Nodal Officer.**

(aa) Compilation of data at Headquarters Siachen Sector.

(ab) Projection of consolidated demand for various equipment and requirement to higher Headquarters.

(ac) Monitoring, collection and release of various items for SSA.

(c) **Sensitising the Environment on Waste Management.** It was felt that to make the initiative a success involvement of the troops in all the activities was of paramount importance. Massive drive was undertaken to educate the troops, through lectures, about the problem and the actions that are planned to be carried out.

(d) **Segregation of Waste.** The segregation of waste is being carried out as under: -

(i) Biodegradable garbage for moving it to the designated Garbage Pits for decomposition.

(ii) Non-biodegradable (non-metallic) waste for moving them to the designated Waste yards for proper disposal through civil administration.

(iii) Non-biodegradable (metallic) scrap for moving it into designated Scrap yards and disposed of through e-auction as per laid down procedures.

8. **Phase 2 & 3.**

(a) **Reduction in Waste Generation.** There is a sizeable amount of waste lying all along the glacier dumped for the last 35 years. Some of the recommended solutions for which actions have already been initiated are as under:-

(i) **Biodegradable Packing Materials.** The introduction of biodegradable packing materials will go a long way in reduction of generation of waste. The provision of Tetra Packs and refill packs for special ration will restrict the use of plastics and glass jars. The limitation of plastic wrappers, polythene covers and extra strong jute packing materials for

(ii) **Replacement of Metallic Packing Material.** The replacement of metallic barrels and jerricanes presently used for storage of kerosene with reinforced HDPE barrels/ jerricanes, which are lighter in weight, will assist in retrieval of waste.

(iii) **Provision of Non-Conventional Energy Sources.**

The provision of non-conventional energy sources at posts will decrease dependency on kerosene oil. A detailed study on the subject has been carried out including use of solar energy, Solar – wind hybrid power plant, Fuel Cell based energy sources, Hydel energy, Wind energy, waste to energy plants, Nuclear / atomic energy etc.

(iv) **Salvage / Garbage Bags for Collection of Waste.** Troops deployed at the forward posts are collecting the waste in sand bags and gunny bags for further extrication out of glaciers. Bio-degradable bags have also been procured centrally and distributed to the battalions for collection of waste.

(b) **Establishment of Waste Extrication Points (WEPs).** Once the waste has been collected and segregated at the post, it was pertinent that it be extricated to suitable WEPs for further disposal. For this purpose, WEPs were identified at suitable locations from where the waste is being extricated rearwards. Central Waste Extrication Pt has been earmarked along each Axis.

The waste from these locations is being extricated to Central WEPs before being sent for further disposal.

(c) **Standardisation of Barrels and WEPs.** A standardised format for the barrels for segregation of waste was formalized and promulgated in the Sector. For ease of functioning and efficient functioning of the WEPs, a standard format for the WEPs to be established at various location were also formulated.

(d) **Use of Helicopters.** It has been planned to effectively employ the helicopters returning after carrying out logistics drops for the post for the purpose of waste extrication from the glacier. Towards this, massive effort was channelized and construction/ expansion of helipad at various posts was executed.

(e) **Extrication of Waste.** The waste is being extricated in two stages as under:-

(i) **Forward Posts to WEPs.** The forward posts, on a regular basis, de-induct the non-biodegradable waste/ scrap to the WEPs. Further segregation of non-biodegradable waste/ scrap is carried out at the respective WEPs. The waste generated is brought to WEP with the help of porters and snowmobiles.

(ii) **WEPs to Base Camp/ Road Head.** From WEPs, the waste is extricated by air/ porter/ snowmobile. Once the waste reaches the WEP, it is further extricated to Central WEP.

(f) **Extrication of Human Waste.** Human waste contributes to a major share of waste being accumulated in the glaciers. Apropos, open defecation has been stopped in the Brigade Area of Responsibility. Extrication of Human Waste posed greatest challenge in terms of collection, storage and further disposal. To overcome the problem, all field latrines have been fitted with suitably mod barrels for defecation and latrine seats have been modified to separate solid and liquid waste. The filled barrels will either be back loaded to bases or waste will be incinerated in electric incinerators.

(g) **Identification of Landfill Sites.** Coordinate with the civil administrator has been carried out to identify suitable landfill site for the dumping of the waste without adversely affecting the ecology.

9. **Phase 4 (Disposal of Waste).**

(a) **Disposal of Bio Degradable Garbage.** Bio-degradable garbage is being brought down to the post and is being turned into compost. The biodegradable garbage is collected in a pit and allowed to decompose for 75–90 days. Multiple Garbage Pits are being used for the purpose. The product so generated is being used as manure for arboriculture and to improve the productivity in the Green Houses in the sector.

(b) **Disposal of Metallic Scrap.** Metallic Scrap is being extricated rearwards and e-auctioning through MSTC (Metal Scrap Trading Corporation) is being undertaken.

(c) **Disposal of Tetra Pak (TPM).** Tetra Pak are being extricated rearwards for recycling. Liaison has been carried out with M/S Tetra Pak at Gurugram, who have agreed to provide TPM compacting and recycling machine which will turn the used TPMs into Bales. The bales will then be transported to Gurugram where these will be converted into paper.

(d) **Disposal of Non Metallic Waste.** Non-metallic waste is being disposed off in the landfills, sites of which have been allotted by the Civil Administration. Locations of these have been suitably selected to avoid polluting the water. This waste will also be recycled in future when resources are available.

(e) **Resource Management.** Considering the herculean effort at hand and the task envisaged, it was felt that available resources may not be sufficient to undertake the task in a time bound manner. It was thus decided that assistance from corporate entities who are interested to assist the Army in the cause be taken under CSR (Corporate Social Responsibility). As projects to assist Army can be undertaken under CSR, corporate houses are being approached to assist us in the initiative. A consolidated list of items that are required has been compiled for the same. In addition, lots of items for waste management have

been projected through Army Commander's Special Financial Powers (ACSFP) also.

(f) **Disposal of Waste.** Due to the massive drive undertaken under SSA, following waste has been collected/ disposed: -

<b><u>S/No</u></b>	<b><u>Type of Waste</u></b>	<b><u>Total Waste (Kgs)</u></b>
(i)	Biodegradable Garbage	21,944
(ii)	Non - Biodegradable (non – metallic) Waste	23,559
(iii)	Non - Biodegradable (metallic) Scrap	25,374
<b>Grand Total</b>		<b>74,307</b>

10. **Perception Management.** Indian Army has been deployed in the Glacier since 1984 and have been the proud guardian of the Frozen Frontiers. In addition to the duties entrusted on the Indian Army it is pertinent that initiatives towards perception management be undertaken so as to project the right image of the Army in front of the civilians and the Nation. To sensitise the tourists visiting the area, boards about 'Swachh Siachen Abhiyan' and relevant instructions to preserve the ecology have been placed at locations frequented by the visitors. Boards' requesting the visitors not to use polythene bags as this area is a '**No Polythene Zone**' have also been suitably placed.

11. **Arboriculture.** The ecology of the area needs to be maintained and Indian Army which has large presence in the area needs to play a minor role in preserving the ecology and spreading greenery in the area. Following actions have been taken in this regard:-

(a) **Green Houses.** All the Green houses/ Poly houses/ Local Ladakhi style poly houses in the Sector are optimally employed and multi-tier farming is resorted to so that the vegetable produce can increase many folds. Numerous varieties of sapling have been procured by the units from various nurseries and from Defence Institute of High Altitude Research (DIHAR). Manure from compost generated within the battalion is optimally being utilized in the Green House to increase the product.

(b) **Arboriculture.** Large quantities of Willow, Poplar trees and local trees and bushes have been planted in the Sector. The sapling once grown will enhance the greenery in the complete brigade sector.

(c) **Trench Farming.** Taking clue from the locals, during winters, trench farming is being carried out by the battalions and is found to be very successful

(d) **Assistance from Experts.** Assistance from DIHAR is being taken for expert advice on arboriculture and to ensure increase in Green house produce.

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