





Training Guidebook on Toxic Waste Handling for Waste Pickers













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Preface

Millions of people in the world are making a living by collecting, sorting, recycling, and selling materials that someone else has thrown away . In Myanmar, waste pickers are the sole provider of solid waste collection, providing widespread public benefits and achieving high recycling rates. Waste picking is one of the most accessible means of livelihood for the low- and medium-income countries as it requires minimal skills, knowledge, or investment. Many a times when doing their regular job, the waste pickers does not realise the short term and long-term impacts of handling the toxic waste inefficiently on their health.

The guidebook, "Training guidebook on toxic waste handling by waste pickers" is prepared as part of PREVENT PLASTICS project. The purpose of this guidebook is to bring awareness among the waste pickers on the possible health effects because of improper handling of toxic waste. It includes topics of hygiene and use of PPEs in the context of waste pickers. This guidebook also covers some component on waste segregation, handling and the actions required at higher level for welfare of waste picker community.

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Image 1: Waste Pickers collecting recyclable waste. Image via Shutterstock.

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1. Introduction: Informal Sector Pyramid

Waste picking is an informal sector which is labour-intensive, lacking health facilities, safety, and legal cover. Large scale waste picking is a phenomenon that arises from the conjunction of absolute poverty with free (or very low cost) resources. Waste picking can be easily learnt and does not require literacy; pickers are often actively recruited by waste traders who offer them loans or even accommodation .

Waste pickers collect garbage in search of recyclable items like paper, plastic etc., That can be sold to scrap buyers or recyclable collector (waste merchants).

Waste pickers do most of the dirty work and together with the rest of the value chain, comprising scrap dealers and recyclers, play an unrecognised but important role in a city's waste management system. They often suffer from bad labour conditions, especially when they work on landfills and dumpsites. They face various risks and hazards, varying from occupational accidents to chemical risks due to toxic substances at dumpsites, ergonomic and psychological problems.





Image 2: Waste Pickers sorting out glass bottles for recycling.

2. Role of Waste Pickers

Economic development around the world has resulted in significant increase of waste from residential, commercial, and industrial units. This waste does not just include the municipal waste but the toxic and hazardous materials. The waste segregation, collection and treatment are done quite inefficiently in the developing low- and medium-income countries. Even the municipal solid waste becomes hazardous and toxic if it is mixed with toxic waste or left untreated releasing obnoxious gases and generating long term and cumulative environmental and human health impacts.

Waste pickers collect household or commercial/industrial waste. They may collect from private waste bins or dumpsters, along streets and waterways or on dumps and landfills. Some rummage in search of necessities; others collect and sell recyclables to middlemen or businesses. Some work in recycling warehouses or recycling plants owned by their cooperatives or associations. What waste pickers have in common is that this work is their livelihood and often helps support their families.

Waste pickers are referred to as the "invisible environmentalists" by The United Nations Environmental Programme . Though the waste pickers are engaged in the work which is considered as "dirty and hazardous", they contribute not just to a country's economy, health, and well-being but also in recycling of waste at the basic level. In fact, they contribute to most, if not all, of the United Nations (UN) Sustainable Development Goals (SDGs).

Collecting door to door waste





Improved public health and sanitation by picking waste from areas not served by municipal garbage collection

Divert a significant quantity of materials from the waste stream into recycling





Cleanliness and helping beautify the city

Figure 2: Role and contributions of waste pickers.

Categorisation of Waste Pickers

The waste pickers are categorised based on the kind of waste collection they do at a particular designated region:

Dump/landfill waste

pickers sorters select and sort recyclables from the landfills, gather organic matter--usually for feeding livestock at disposal sites; may live on the disposal site in shacks or nearby Street waste pickers

collect mixed waste disposed in garbage bags and bins on streets or in dumpsters; some have arrangements with commercial and/or office buildings and may have access to previously segregated material.

Doorstep waste pickers

the most common category collects waste from door-to-door, operated mainly by municipalities in partnership with membership-based organisations of waste pickers. Cooperatives with formal or informal agreements with commercial/office buildings may have members engaged in the collection of large quantities of materials by trucks or other vehicles.

Waste pickers working at pagodas, temples, tourist attraction points and riversides picking only for resalable items such as "fresh flowers and petals, food offering from pagoda/ temples.

Truck waste pickers refers

to formal collection crews who segregate recyclables from household waste as a supplement to their salaries. The term can also designate informal pickers who have permission to collect materials alongside collection crews. Waste pickers may also be categorised by their involvement with organisations, municipalities, or industries.



Figure 4: Categorisation of waste pickers based on their involvement with other stakeholders

The disorganised or autonomous waste picker is the one who makes a living picking or buying recyclable materials on the streets or in waste dumps and selling it to junkshops. These workers are not connected to waste pickers associations or cooperatives, although they may sometimes sell the collected materials to these associations. Organised waste pickers who work through municipalities, cooperatives, and associations.

The waste picker with a contract who works mainly in junkyards or in the metallurgic industrial sector, but also in the public municipal sector or in associations and cooperatives.

Figure 3: Categorisation of waste pickers based on the location of waste collection

4. Challenges Faced by Waste Pickers

In Myanmar, waste management practices are inadequate at local, regional, and national levels; although there is basic awareness about the importance of protecting waste pickers, industrial workers, and health workers. Often in the chain of solid waste management, waste goes from households either to waste collectors or into the bin. From the bin, the waste travels to transfer stations and then finally to the landfill sites. However, through this entire journey, neither the households nor the municipal corporation actively segregate the waste. In some places, the aim is for the solid waste to be segregated in the end to be fed to a waste-to-energy plant, but in most cases, they are just landfilled. In the landfill, the said waste continues to remain as is and piles up to resemble mountains, and eventually starts discharging poisonous gases and leachate into the air and soil respectively.

Myanmar does not have either specific regulations, laws, or reinforcements for waste pickers or an efficient collection system at the regional and national levels. Hence, waste pickers who are extremely poor and often illiterate rural immigrants who have no access to social or physical infrastructure like basic sanitation, water, and power supply and receive no benefits, legal protection, or security from the state for their valuable services. Due to non-recognition, waste pickers are often excluded from various government health schemes. Moreover, their jobs are highly insecure. There is no direct acknowledgement of their contribution and even today, there is no single law that concretely recognises their profession.

Also, one of the biggest health and safety risks that the waste pickers faced were on a social and interpersonal level in their living and working spaces. Problems like stigmatisation, substance abuse, poverty, harassment (in terms of long working hours, low wages, exploitation, child abuse and traffickers), and violence in their immediate environment. Throughout the world, there is a stigma attached to waste picking as a profession has rendered them prey to discrimination, violence, and harassment.

One of the challenges is not enough awareness on the use of appropriate protective clothing and gear such as gloves and masks. Because of the hot and

humid climate in Myanmar, the waste pickers do not feel comfortable in wearing the PPEs even when these are provided to them. Because of long working hours on dumpsites and landfills, they are prone to respiratory infections such as lung impairment and hampered lung function.

Also, the lack of infrastructure such as secure road networks is a serious challenge as waste pickers have to use the same roads with motorists and this usually results in a number of waste pickers being involved in road accident, some of which can even be fatal. They also have to use equipment like carts and tricycles on these roads. Another point related to infrastructure is that some waste pickers which are engaged informally in this business, have to sleep on the landfill which indicates that there is a lack of access to proper infrastructure, water facilities. Not having access to these facilities on both the landfill where they work and at the place where they sleep increase waste pickers' vulnerability to health risks.



Figure 5: Challenges faced by waste pickers

5. Municipal Solid Waste

Mixed or unsegregated waste makes the resource recovery quite difficult. Due to this, some material that is recyclable does not get recycle and end up in landfill e.g. the paper packaging on food waste can be segregated out of this one can be composted and other can be sent for recycling. Therefore, waste stream should not get mixed as normally happens in a dumpster or landfill site. The first level of segregation should be done at households/industries where the waste is generated and the second at the level of waste pickers. This also reduce the amount of waste getting dumped at the landfill. The waste segregation done by waste pickers can help identify the best recycling or disposal route for the waste. Having identified the first recycling route, more material can be effectively recycled.

Waste pickers need to have awareness in different types of waste that are generated from various sources, including knowledge on the toxicity and risks associated with certain types of waste. This will help them not only segregate the waste appropriately but also to adopt suitable practices and choose appropriate PPEs when handling toxic waste.



Source	Typical Waste Generators	Types of Solid Wastes	
Residential	Single and multiple families	Food waste, paper, cardboards, plastics, textiles, glass, rags, metal, ashes, battery, oil, tyres, and household hazardous waste etc.	
Commercial	Stores, restaurants, markets, hotels, office buildings etc.	Food waste, paper, cardboard, plastic, wood, glass, metal, e-waste, battery, hazardous waste etc.	
Institutional	School, colleges, universities, hospitals (health care services), government centres like prisons	Food waste, paper, cardboard, plastic, wood, glass, metal, e-waste, battery, hazardous waste and health care waste etc.	
Municipal services	Street cleaning, drain cleaning, parks cleaning, beaches etc.	Waste from street sweeping, tree cutting, tree trimming, fallen leaves, plastic, slippers, organic waste from parks, beaches etc.	
Construction and demolition	New construction site, renovation, or demolition sites	Wood, metal, concrete, dirt etc.	

Table 1: Types of solid waste along with sources of waste generation

6. What is Toxic/ Hazardous Waste?

Most of the challenges in terms of health, injuries amongst waste pickers are because of:

- Lack of awareness on the various kinds of waste, effective handling, recycling or disposal methods.
- Lack of awareness on the hygiene and safety related actions.

Having identified toxic and hazardous waste, the way of handling this waste properly is defined in section 7 of this report. Many health- related risks could be minimised in waste pickers community by taking hygiene related actions and use of appropriate PPEs as highlighted in 7.1 and 7.2.

Hazardous waste is defined as any substance or material that can have harmful effects on the health of people and the environment. The symbols given below can be used identify by waste pickers if the waste is toxic. Looking for these symbols will help waste pickers carefully handle the waste.

Below are the some of the characteristics that are identified with hazardous wastes.



Ignitability- Any waste that is flammable and can create fires. Examples of this include liquids with flashpoints below 60°C, non-liquids with the potential to ignite via specific conditions and compressed gases.



Corrosivity- Any waste (typically acids and bases) that can rust and decompose and has the ability to melt through steel materials. Examples of this include aqueous wastes with an acidity level of equal to or less than 2 pH or equal to or greater than 12.5 pH.



Reactivity- Any waste that is explosive, unstable under normal conditions. Examples of this include any waste capable of explosion and detonation that may produce toxic gases.



Toxicity- Any waste that is fatally poisonous when ingested or absorbed. Examples of this include lithium-sulphur batteries and other materials that can cause death when swallowed.

Toxic waste is harmful or fatal to a living organism when ingested or absorbed. So, Hazardous waste may sometimes be toxic but toxic waste will always be hazardous waste. Toxic waste results from industrial, chemical, and biological processes.



Image 3: Waste catching fire on its own because of hazardous substance mix

Sources of hazardous waste	Common examples of hazardous waste
By products-	Waste oil and fuel
industrial and domestic activities	Solvents and thinners
Mining sites or mineral processing sites	Toxic and flammable paints
Agricultural facilities and research laboratories	Chlorinated solvents and heavy metals
Contaminated sites and	Perchlorates and peroxides
building material	Radioactive waste
Agricultural land or agro-industry	

Table 2: Sources of hazardous waste along with some examples



Image 4: Examples of Hazardous waste

7. Handling of Toxic Waste by Waste Pickers

There are many health risks associated with handling of toxic waste. A brief of the risks is given below:

Actions	Effects	Guidance
 Working at landfills, handling mixed waste (biomedical/ hazardous) without safety measures Lack of use of PPE 	 Transmission of viruses like HIV Injury by sharp objects like needles and injections Respiratory problems, skin problems and neurological and kidney and liver diseases Exposure to tapeworm, liver flukes' eggs Injury by sharp materials like glasses and used needle Frequent stomach infections like nausea, Dysentery, and intestinal pain 	 Follow the relevant steps given in basic hygiene in next sections Use all the appropriate PPEs required to do a task safely. The detail of PPEs is given in next section like Goggles: to protect eyes from splashes waste or sewage. Protective face mask or splash-proof face shield: to protect nose and mouth from splashes of waste. Liquid-repellent coveralls: to keep waste or sewage off clothing. Waterproof gloves: to prevent exposure to waste or sewage. Rubber boots: to prevent exposure to waste or sewage. Request for the PPEs by authorities if not provided or for replacement.

	Actions		Effects		Guidance
• H ha sa ai ki	andling of azardous nemicals without afety equipment nd required nowledge	•	The handling of the hazardous waste without safety equipment leads to long terms effects of cancer, harmful health effects on children and pregnant women defects in new-born babies, miscarriages	•	Use PPEs whenever working at waste site or handling waste Request training from authorities on waste management and handling
C of d d w in fa b fl fl a a r c	onsumption f bad food and rinking polluted ater, and coming to contact with lecal matter, ood, bodily uids, animal esh, and dead nd live infected nimals such as odents	•	Infections in digestive track, skin infections Tuberculosis	•	Get yourselves and family immunised agains common infections like hepatitis B, tetanus etc.
 H R U m of pl si ai ai<td>eavy lifting, epetitive motion nnatural lovements f body hard hysical work, uch as pushing nd pulling bags nd trolleys nd carrying rge bags of ecyclables. ushing heavy ads and pulling eavily laden olleys over long stances or arrying heavy ags</td><td>•</td><td>Back and lower extremity pain Musculoskeletal damage leading Injury</td><td>•</td><td>Immediate first-aid measures, such as cleansing of wounds and skin Splashing of eyes with clean water An immediate report of the incident to a designated responsible person In case of a needle/glass metal injury, bleeding of the wound should be encouraged, and the area should be washed under clean running water. The remaining elements of the accident response plan should then be followed.</td>	eavy lifting, epetitive motion nnatural lovements f body hard hysical work, uch as pushing nd pulling bags nd trolleys nd carrying rge bags of ecyclables. ushing heavy ads and pulling eavily laden olleys over long stances or arrying heavy ags	•	Back and lower extremity pain Musculoskeletal damage leading Injury	•	Immediate first-aid measures, such as cleansing of wounds and skin Splashing of eyes with clean water An immediate report of the incident to a designated responsible person In case of a needle/glass metal injury, bleeding of the wound should be encouraged, and the area should be washed under clean running water. The remaining elements of the accident response plan should then be followed.

	Actions	Effects	Guidance
•	Working without shade, directly under sun for long hours	 Disorientation, dizziness Exposure to pathogenic 	 Request authorities for provision of clean water at waste handling and management sites
•	Burning of waste on landfills and	organisms, insects, rodents	Keep yourself hydrated with clean water
	release of excess fumes • Exposure to air pollution from dust, accidental burning, • Ground and	 Request authorities to provide shade on dumpsites/landfills for break/rest period 	
		surface water pollution from issues of unaddressed leachate	 Always use sun caps (if not appropriate PPE) when working under sun.
		 Difficulty in breathing and chronic cough Harmful health effects on children and pregnant 	

7.1 Follow basic hygiene practices

- Wash hands with soap and water immediately after handling human waste or sewage.
- Avoid touching face, mouth, eyes, nose, or open sores and cuts while handling human waste or sewage.
- Before eating, removed soiled work clothes and eat in designated areas away from human waste and
- · Sewage-handling activities.
- Do not smoke or chew tobacco or gum while handling human waste or sewage.
- · Keep open sores, cuts, and wounds covered with clean, dry bandages.
- Gently flush eyes with safe water if human waste or sewage contacts eyes.
- Use waterproof gloves to prevent cuts and contact with human waste or sewage.
- Wear rubber boots at the work site and during transport of human waste or sewage.
- Remove rubber boots and work clothes before leaving work site.

women

Table 3: Health effects of hazardous waste handling in waste pickers and handlers

7.2 Use of all relevant PPEs when working

The table highlights the other PPEs which can be provided to waste pickers and used by them as per the waste they are handling, and the risks involved.



Eye Protection

Types of Protection	Types of PPE
Eye and face protection	Safety glasses, goggles, face shields
Head protection	Protective helmets such as hard hats
Hearing protection	Single-use earplugs, moulded earplugs, or earmuffs
Respiratory protection	Dust Masks, Air-purifying respirators
Foot and leg protection	Metatarsal guards, toe guards, foot and shin guards, steel- toed boots, safety shoes/boots, and leggings
Hand and arm	Durable work gloves, fabric/coated fabric protection gloves, chemical/liquid resistant gloves, and insulating rubber gloves
Torso protection	Chemical protective clothing (CPC), Flame/heat resistant clothing, cooling vests and full body suits
Fall protection	Full-body harnesses and body belts (only when used as part of a positioning system that limits falls to two feet)
Musculoskeletal	Back belts, joint braces, and other devices designed to prevent overexertion-type injuries
Buoyant protection	Personal flotation devices (PFDs) such as life jackets and vests

Table 4: List of PPEs

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8. Other Actions That Could Be Taken

The collective actions on various levels are needed for the improvement in condition of waste pickers. The framework below is developed with reference to a similar framework on challenges by waste pickers .

8.1 Individual Level

These are the actions which waste pickers or waste handlers must take as an individual or as a group:

- Use of appropriate personal protective equipment (PPEs) by waste pickers.
- Use of sorting tools for waste segregation
- Actively participating in trainings on waste segregation, waste handling, recycling, and awareness workshop by municipal authorities
- Highlighting challenges faced in day-to-day work to municipal authorities and participating in solution
- Maintaining hygiene on personal level by cleaning hands by using hand sanitiser / Soap,
- Efficient waste segregation using colour coding bins and challenging waste then for treatment, recycling, and disposal.
- To register as waste picker
- To formally organised waste picker unions or cooperatives

8.2 Community Level

These are the actions which people should take from residences, industries, commercial offices, and institutes so as to make the job of waste pickers a bit easy:

- Conducting session to make a note of challenges faced by waste pickers and taking actions for solving the problems.
- Recognizing the health hazard for waste pickers at all collection centre like residential, commercial, institution and industrial. So that waste segregation can be initiated at the source.
- Raising awareness between stakeholders on proper packaging of waste before handing over to waste pickers especially hazardous waste.
- Necessary support provided to waste pickers in their job by showing respect, empathy.
- Recognizing waste pickers and seeking support from local government for their welfare.
- Public campaigns to dignify the work of waste pickers and gain public recognition.
- Mobilisation of the media to show the issue of child waste pickers / child labour in waste management.
- Provide shelter for street children.
- Provide drinking water and sanitation facilities in waste dumpsite gates, shelters.

8.3 Institutional Level

Actions to be taken by municipalities:

- Conducting regular training cum awareness workshop on waste segregation and management for waste pickers. Training in health and safety should ensure that workers know of and understand the potential risks associated with health-care waste, the value of immunisation against viral hepatitis B, and the importance of consistent use of personal protection equipment.
- Categorisation of waste pickers according to waste they handle and providing training on waste handling and PPEs accordingly.
- Training and awareness on efficient use of PPEs
- Providing necessary equipment to waste pickers for ease of work like pushcarts and automated carts for waste movement
- Providing necessary PPEs.
- Conducting awareness for citizens also to make them realize the criticality and health hazard related to the waste handling.
- Regular health check-ups and vaccination for waste pickers
- Engaging with government for rights of waste pickers, raising the challenges they face and finding solutions, taking actions.
- Integrating waste pickers in reducing waste from an area. By measuring and monitoring the quantity of waste or non-segregated waste from a region and based on those taking actions.
- Initiate computer based live monitoring at landfills, dumpsites, waste processing areas for checking activities, PPE are being used. In case of accident emergency treatment, first aid could be provided.
- Provide first aid kit in each waste processing site. The waste pickers should be made awareness on the location, accessibility and use of first aid kit.
- · Health insurance for waste pickers
- Taking regular pest control measures at waste collection, segregation, recycling, and landfills. Preventing the widespread exposure to pests, including rats, cockroaches, and pigeons, were serious health risk factors that urgently needed to be controlled.
- Recognise the right of waste pickers: registration, identification (Provision

of IDs and birth certificates), make sorting/ waste picking recognised work.

- Improve working conditions (equipment/tools, rest area, uniforms, sanitary and washing facilities at dumpsites or their workplace, etc)
- Prepare a separate sorting area at landfills or disposal sites.
- Training in the sorting, pre-processing, and recycling of waste materials or repair of used items for adults and youth.
- Workshops for children or adults to make objects from recyclables (e.g., toys)

8.4 Policy

These actions could be taken by state and central government for welfare of waste pickers:

- Implementing polluter pay principle for reduction of waste generation at source
- Providing subsidies to municipalities for procurement of PPEs for waste pickers
- Unique ids for waste pickers so that they can avail medical services and recognized as a proper profession.
- Regular medical check-up which is free of cost for waste pickers and family
- · Inclusion of waste pickers in all social welfare schemes
- Free treatment for waste pickers and family
- Vaccination against infectious disease, including hepatitis A, hepatitis B, and tetanus, significantly reduce the risks related to being in touch with dirty and contaminated materials
- Supporting municipalities and private waste collectors with funds for their smooth and transparent functioning.
- National law to support waste pickers and their work, linked to local waste management policies.
- Recognise the right of waste pickers: registration, identification (Provision of IDs and birth certificates), make sorting/ waste picking recognised work.

8.5 Efficient waste handling

The disposal of hazardous waste is more complex than regular municipal waste due to the threats the waste type poses to humans and the environment. Therefore, only authorised vendors/handlers can handle, manage, and dispose of hazardous waste. Hazardous waste not disposed of properly can incur great amounts of remedial action to reduce contamination and environmental damage.

Some hazardous waste can be recycled. E.g., fluorescent light bulbs, batteries, cleaning fluids, oil-based paints, propane and butane tanks, automobile fluids and more.

Alternatively, hazardous waste may be treated using chemical, thermal, biological, or physical methods. Examples include incineration, chemical neutralisation or land-farming.

The picture given below is taken from article 'S. Priyadarshini, Need for proper waste management in India'.





8.6 Waste colour coding

- Some colour coding related to type of waste could be decided by local government/municipality, residents, and waste pickers.
- This colour coding should be promoted and implemented by residents while giving waste to waste pickers
- Waste pickers should use this colour coding while waste segregation and sending the waste ahead for processing.

The list given is a suggestive list. Different countries use different colour coding for waste. The local municipal authority along with relevant stakeholder can decide which colour coding to use for which type of waste and then provide training to waste pickers on the same. It can be adapted by municipality/waste pickers based on the availability of dustbins or packaging material available at their area.

8.7 Waste sorting

Some of the waste sorting methods which are/can be used by waste pickers at the waste processing unit/landfill/dumpsite are:

- Manual separation- Doing it by hands but using all the appropriate PPEs
- Air separation- blower may be used to separate light waste with heavy waste like paper, plastic from metal
- Magnetic separation- tongs for picking up waste or tongs with magnet may be designed to separately metal related waste with other waste. Tongs can otherwise be used as an effective tool for separating glass waste without getting injured.

Colour Code	Type of waste	What can be done?	
23	Organic waste- food waste, vegetable waste, garden waste	Composting, manure as garden, biogas generation	
6	Metal waste	Recycling	
3	Paper waste	Recycling	
0	Hazardous waste- e-waste, chemicals, glass	E-waste- recycling Glass- recycling	
0	Sanitary waste/ biomedical waste- syringes, cotton with blood	Incineration	
3	Construction and demolition waste	Reuse for paving of roads, low grade construction	
•	Plastic waste- PET bottles, packaging waste etc	Recycling	

Table 5: Suggested colour coding for different types of waste segregation

9. Conclusion

Waste picking as a job, lends itself to innumerable health risks. These risks can be reduced through concerted and collaborative efforts on the part of waste pickers, landfill operators, local authorities, and other stakeholders.

Waste pickers will never have a risk-free environment, but regular training on effective waste handling, awareness on health impacts, facilitative policies and supportive institutions can collaboratively help to mitigate these risks and create a more sustainable and dignified working environment towards sustaining their livelihoods. The actions are also required at waste picker's level as it is important for them to realize the critical work they are doing and risk they can mitigate by taking simple actions.

In addition, the policies and regulations must be mandated for waste pickers to protect their rights and safety at the national and regional level.



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