

WISH Programme



International
Labour
Organization



Work Improvement for Safe Home

Action manual for improving safety
and health of E-waste workers

Tsuyoshi Kawakami



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and health of e-waste workers**

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Preface

E-waste (electrical and electronic waste) workers are contributing to the socio-economic development through their collecting, dismantling, disposing and recycling work. They are exposed to many safety and health hazards and risks arising from their work, such as carrying heavy waste materials, exposure to heat, dust, and hazardous chemicals, working in narrow workplaces in strenuous postures, unsafe use of electricity and machinery, and long and irregular working hours. Most of e-waste workplaces are in the informal sector and workers rarely receive adequate protection. Workers need practical support to make their workplaces safer, healthier and more productive.

This manual aims to assist e-waste workers in improving their safety, health and working conditions. The manual shows many low-cost ideas that e-waste workers can easily adopt by using locally-available materials. The ideas are also useful for improving productivity and efficiency at their e-waste workplaces and can support the growth and sustainability of their businesses.

The manual was developed based on the ILO's WISH (Work Improvements for Safe Home) manual. Many home-based manufacturing workers in different countries have implemented these practical, low-cost ideas - shown in the WISH manual - and have found that now their workplaces are safer, healthier and they are more productive. Based on WISH's success, this manual has been redesigned specifically for small-sized, e-waste workplaces.

IFC (International Finance Corporation), ILO (International Labour Organization) and Karo Sambhav – together have



developed this manual as a part of IFC's India E-waste Program. The Program received financial support from the Government of Japan and the Korea Green Growth Trust Fund of the World Bank Group. Dr Tsuyoshi Kawakami, Senior Specialist on Occupational Safety and Health, ILO Decent Work Team for South Asia, has authored this manual. Ms Sarina Bolla, Dr Neeta Misra and Mr Ronojoy Guha Sircar of IFC, Ms Kanagarani Selvakumar, ILO Office for India, and Mr Vikash Rajput, Karo Sambhav have contributed with their technical inputs.

I sincerely hope that the manual will help many e-waste workers improve their safety, health and working conditions.

Dagmar Walter

Director
ILO Decent Work Team for South Asia and
Country Office for India

Table of contents

Preface	3
Action checklist for e-waste workers	7-14
Checkpoint 1 - Clear and mark transport ways.	16
Checkpoint 2 - Use carts and hand-trucks when moving materials.	17
Checkpoint 3 - Provide multi-level shelves near the work area for materials and products.	18
Checkpoint 4 - Use appropriate chairs and tables and adjust your working height to elbow level or slightly lower than elbow.	19
Checkpoint 5 - Put frequently used tools and materials within easy reach of e-waste workers.	20
Checkpoint 6 - Attach proper guards to dangerous moving parts of machines.	21
Checkpoint 7 - Make sure machines are well maintained and have no broken parts.	22
Checkpoint 8 - Ensure safe wiring connections for supplying electricity to equipment and lights.	23
Checkpoint 9 - Add more daylight and keep windows and skylights clean.	24
Checkpoint 10 - Isolate the sources of dust, hazardous chemicals, noise or heat from the e-waste workplace.	25
Checkpoint 11 - Increase natural ventilation by having more openings, windows or open doorways.	26
Checkpoint 12 - Provide adequate clothes and personal protective equipment such as glasses, masks, shoes and gloves.	27
Checkpoint 13 - Provide at least two unobstructed exits from rooms and enough fire extinguishers.	28
Checkpoint 14 - Provide an adequate supply of safe drinking water in the e-waste workplace.	29
Checkpoint 15 - Provide clean toilets and washing facilities close to the work area.	30
Checkpoint 16 - Provide a separate hygienic place for eating meals and a resting facility.	31
Checkpoint 17 - Provide first-aid equipment and train qualified first-aiders.	32
Checkpoint 18 - Combine tasks so that each e-waste worker can perform varied and interesting work.	33
Checkpoint 19 - Train e-waste workers for safe and efficient operation.	34

WORKPLACE CHECKLIST for E-Waste Workers

Materials Storage and Handling

1. Clear and mark transport ways.

Do you propose action ?

No Yes Priority

Remarks:.....
.....



2. Use push carts and hand-trucks when moving materials.

Do you propose action ?

No Yes Priority

Remarks:.....
.....



3. Provide multi-level shelves near the work area for materials and products.

Do you propose action ?

No Yes Priority

Remarks:.....
.....



Action checklist

Work-stations

4. Provide workers with chairs and tables of correct height with sturdy backrest.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



5. Adjust working height for each worker at elbow level or slightly lower than elbow level.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



6. Put frequently used tools and materials within easy reach of workers.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

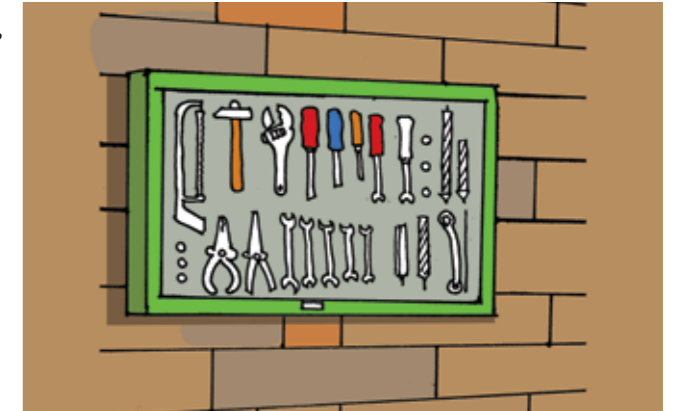
7. Provide a conveniently placed home for each tool.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Safe use of Machine and Electricity

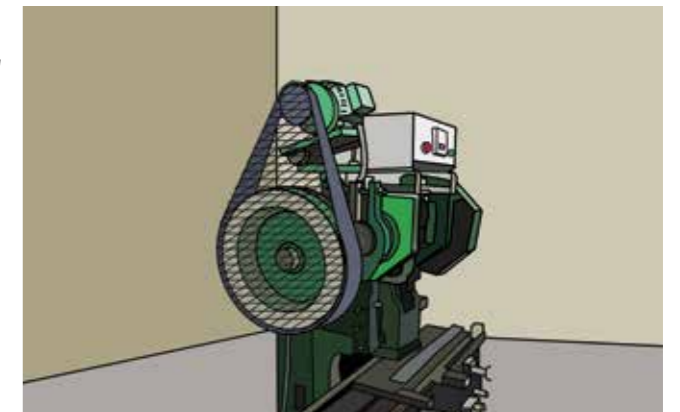
8. Attach proper guards to dangerous moving parts of machines.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



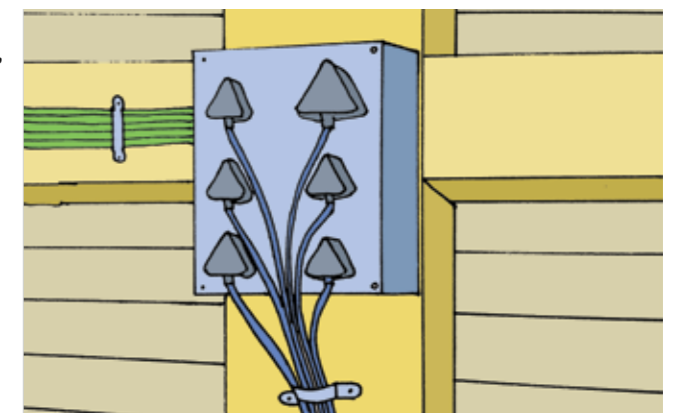
9. Ensure safe wiring connections for supplying electricity to equipment.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

Physical Environment

10. Add more daylight and keep windows and skylights clean.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



11. Use local task lights to ensure sufficient brightness necessary for work.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



12. Isolate the sources of dust, hazardous chemicals, noise or heat from the workplace.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

13. Increase natural ventilation by having more openings, windows or open doorways.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



14. Provide adequate clothes and personal protective equipment such as glasses, masks, shoes and gloves.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



15. Provide at least two unobstructed exits from rooms and enough fire extinguishers.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

Welfare Facilities

16. Provide an adequate supply of safe drinking water in all workplaces.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



17. Provide clean toilets and washing facilities with soap close to the work area.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



18. Provide a separate hygienic place for eating meals and a resting facility.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

19. Provide first-aid equipment and train adequate number of qualified first-aider.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Work Organization

20. Adjust workplaces to meet the needs of pregnant women and workers with disabilities.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



21. Have frequent short breaks during work.

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Action checklist

22. *Encourage e-waste workers to exchange ideas for improving safety and health together.*

Do you propose action ?

No Yes Priority

Remarks:.....

.....



Additional items

23.

Do you propose action ?

No Yes Priority

Remarks:.....

.....

24.

Do you propose action ?

No Yes Priority

Remarks:.....

.....

CHECKPOINT 1

Clear and mark transport ways.

E-waste workplaces need clear transport ways. Although they often have limited space, you can make convenient transport ways by simply removing unnecessary materials as much as possible. Your products and materials may be heavy, varied in shape and difficult to handle. Clear and safe passageways can help e-waste workers handle different materials easily, prevent fatigue and reduce work time.

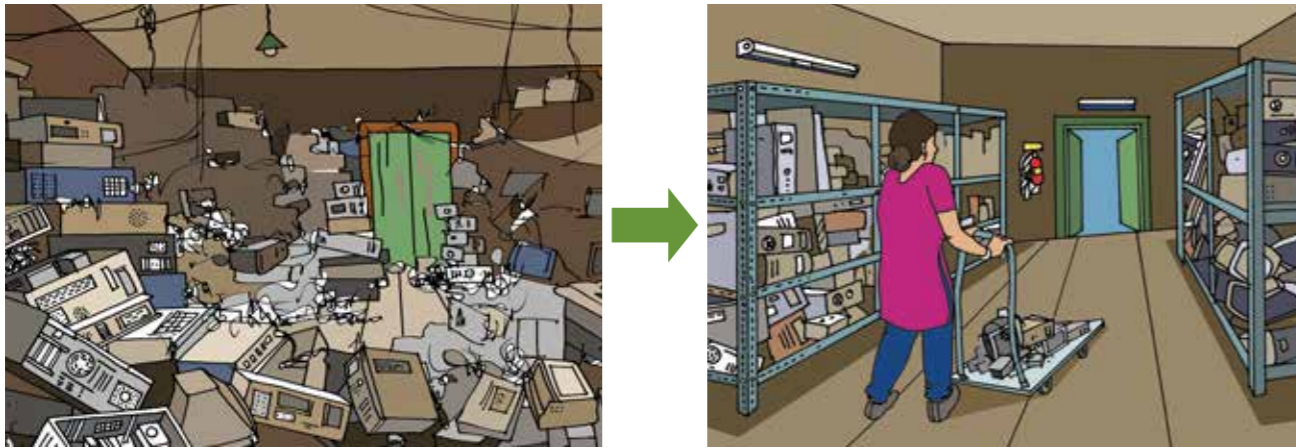


Figure 1. Clear passageway for smooth transportation of materials or products.

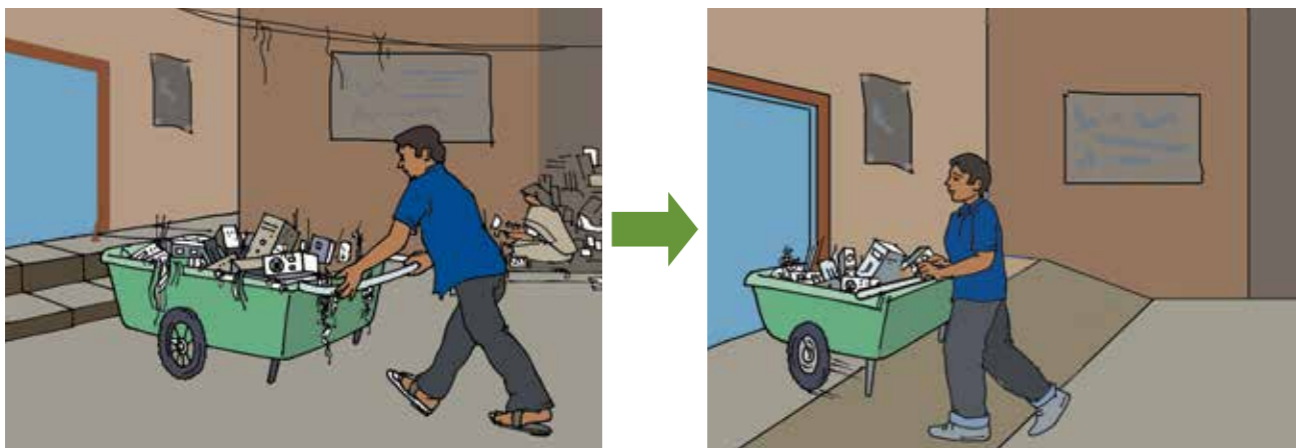


Figure 2. Provide ramps where there are height differences.

CHECKPOINT 2

Use carts and hand-trucks when moving materials.

E-waste workers need to move raw materials and products everyday between their workplaces and storage areas. By using carts and hand-trucks, you can move the materials easily and safely. The probability of product damage and accidents will be much lower. Carts and hand trucks allow you to carry more materials at one time. The number of your trips will decrease. You can save your work time and produce more products efficiently and safely.



Figure 3. Use carts and hand-trucks when moving materials.

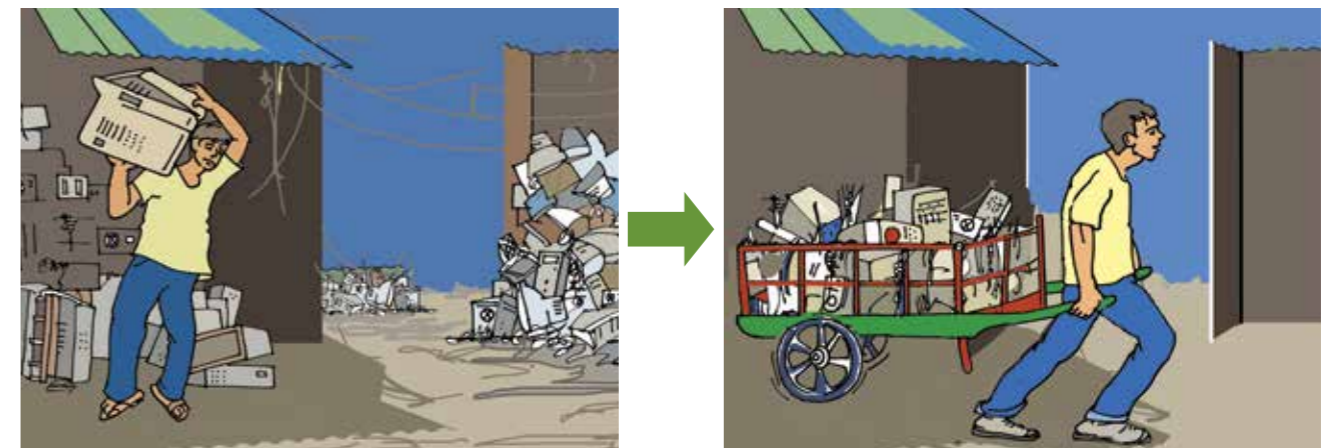


Figure 4. Choose carts with larger wheels on the rough floor.

CHECKPOINT 3

Provide multi-level shelves near the work area for materials and products.

Most e-waste workplaces have only limited space. Many e-waste workers are concerned about the effective use of their work space. Multi-level shelves and racks give you workable solutions. You can even use the wall and overhead space to keep materials. This will make your floor space larger. There is another advantage. By placing things on multi-level shelves, you can easily find necessary items at an appropriate height, and therefore save your time.

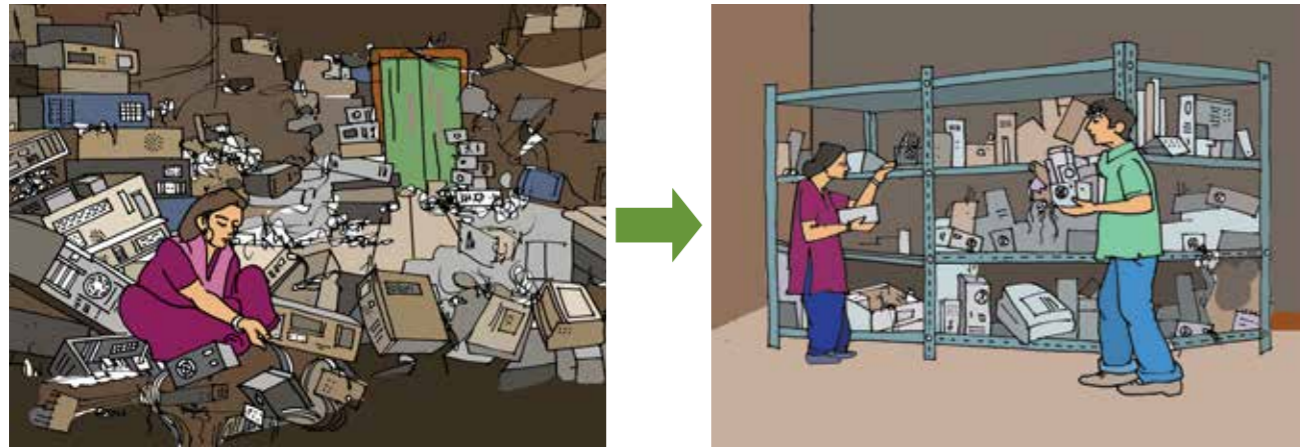


Figure 5. Use a multi-level rack for storing materials and products and save space.



Figure 6. Use carton boxes with labels for storing materials and products in designated areas.

CHECKPOINT 4

Use appropriate chairs and tables and adjust your working height to elbow level or slightly lower than elbow.

Proper working height is very important for the work of e-waste workers. Working height is directly related to your health and productivity. If the working height is too high, your arms and shoulders are kept elevated and you will suffer from strain. When the working height is too low, you will have to bend your back continuously and will have low-back strain. These strains will gradually increase stiffness and pain. It will eventually be difficult for you to work. Adjusting the working height for each worker to around elbow level or slightly lower than elbow level minimizes your muscular effort in your arms, shoulders and back. This principle is applicable for both standing and sitting workers.

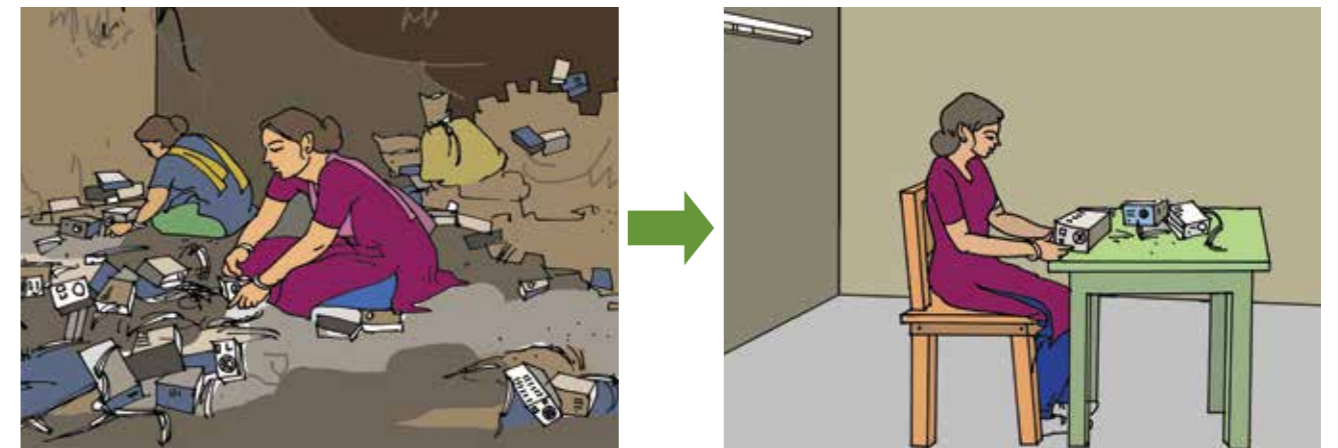


Figure 7. Provide workers with chairs and tables of correct height with sturdy backrest.

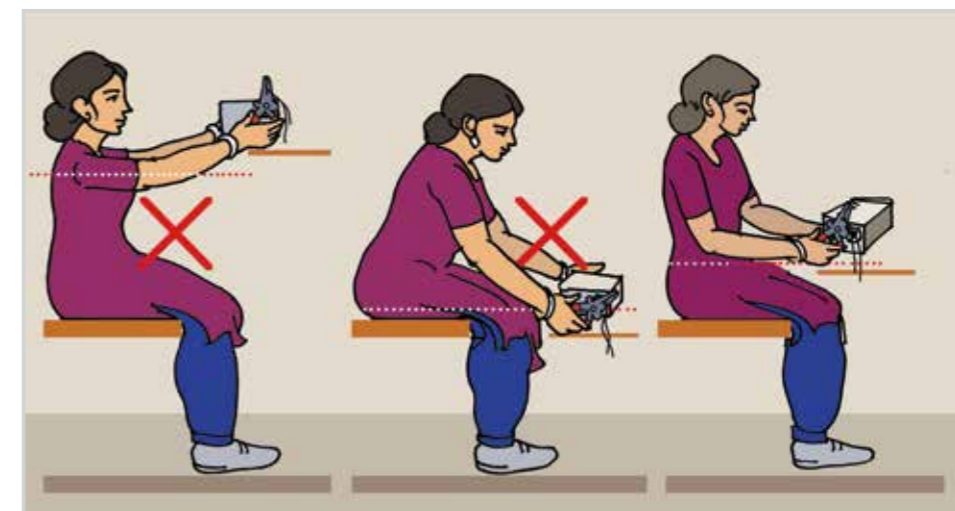


Figure 8. Adjust your work height to elbow level or slightly lower than elbow.

CHECKPOINT 5

Put frequently used tools and materials within easy reach of e-waste workers.

E-waste workers use many kinds of tools and materials. Some of them are small and easy to lose. Frequently used tools and materials should be placed within easy reach of e-waste workers. By doing so, you will minimize unnecessary strenuous movements such as extending your arm or bending your back to reach these materials and your productivity will increase. You will be surprised with the time and energy saved.

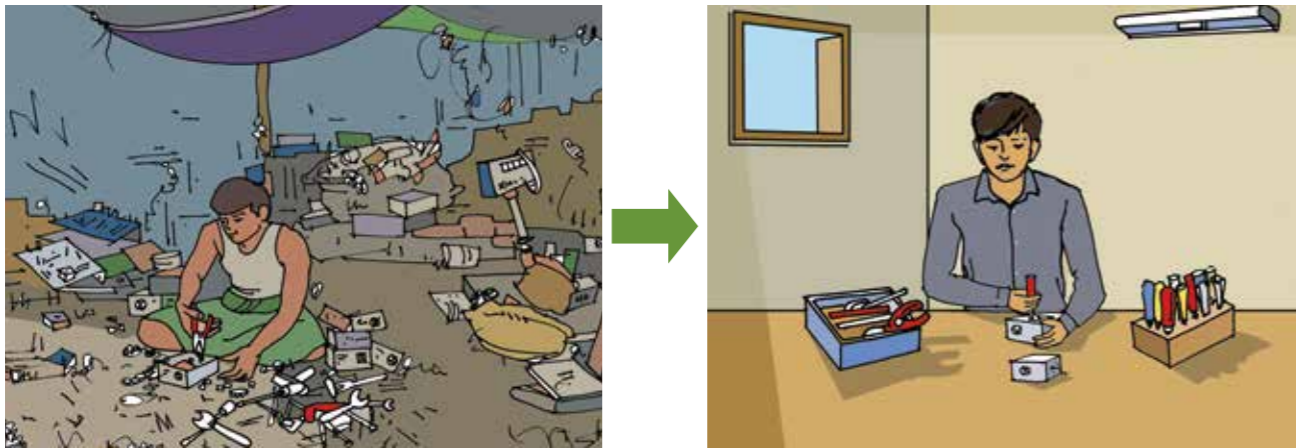


Figure 9. Keep frequently-used materials within easy reach and in an orderly manner.

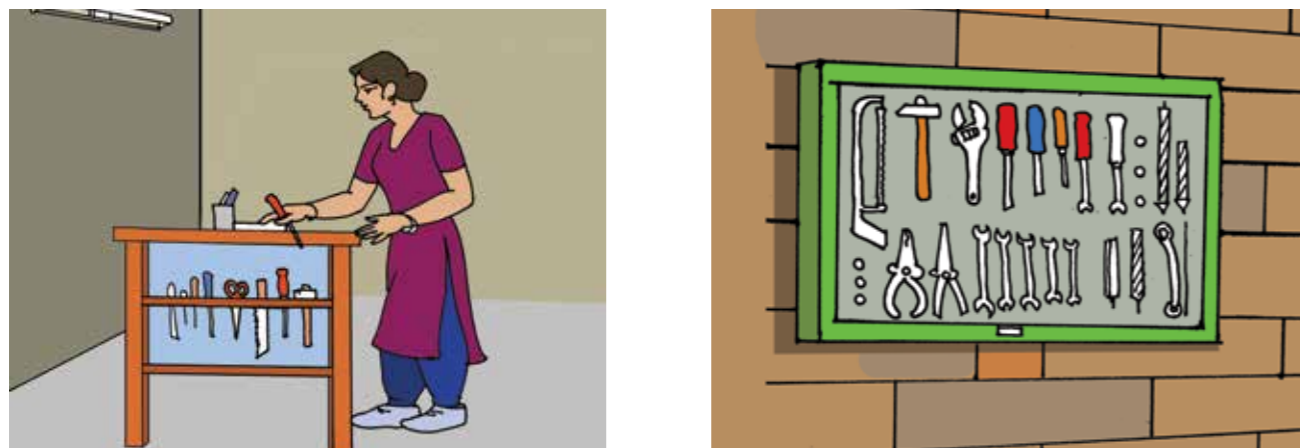


Figure 10. Provide a conveniently placed “home” for each tool.

CHECKPOINT 6

Attach proper guards to dangerous moving parts of machines.

E-waste workers use machines in their narrow workplaces. Injuries could occur from rollers or moving belts. You and your family members (often children) may become injured when they pass by the machine. You can increase safety by making and attaching guards to moving parts of machines. With these guards, you do not need to worry about the danger of machines and can concentrate on your work. You will experience productivity improvements, too.

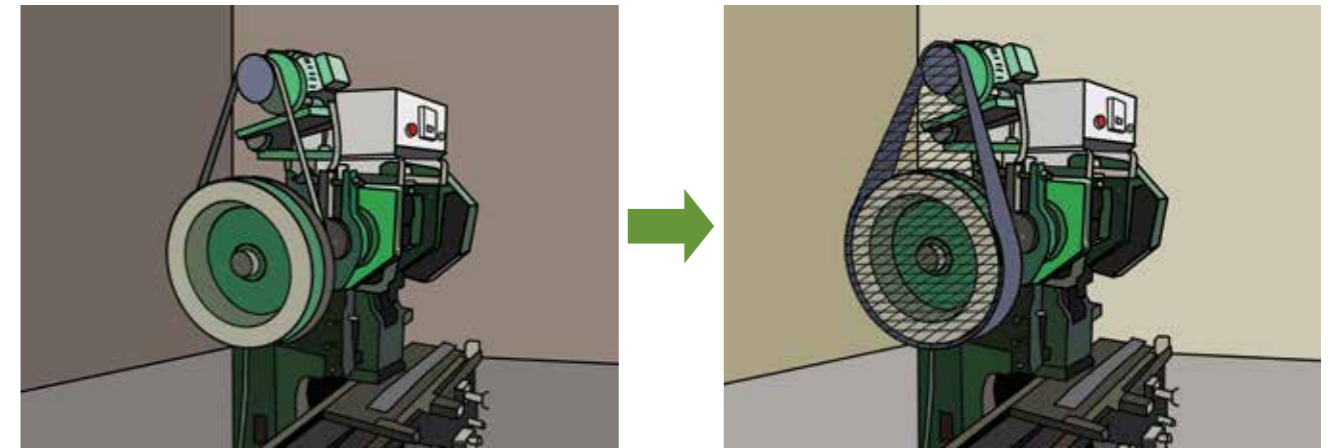


Figure 11. Attach proper guards to dangerous moving parts of machines.

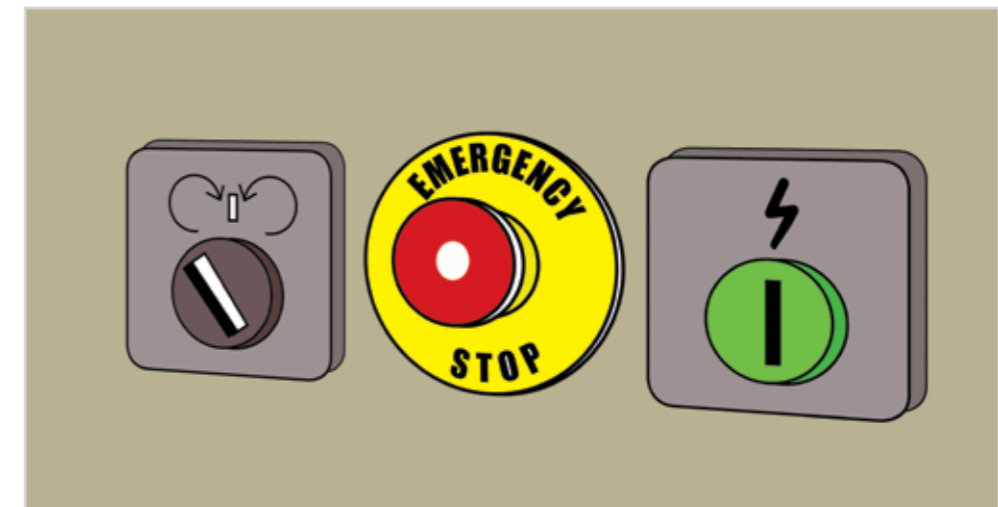


Figure 12. Make the emergency stop switches clearly visible.

CHECKPOINT 7

Make sure machines are well maintained and have no broken parts.

Every machine requires regular maintenance for high productivity and safety. E-waste workers spend a lot of money on purchasing machines and need to use them for a long time without problems. Broken or wobbling parts of the machines should be repaired immediately. Even if your machine seems to have no problem, through regular inspections and maintenance you can ensure safety and productivity.

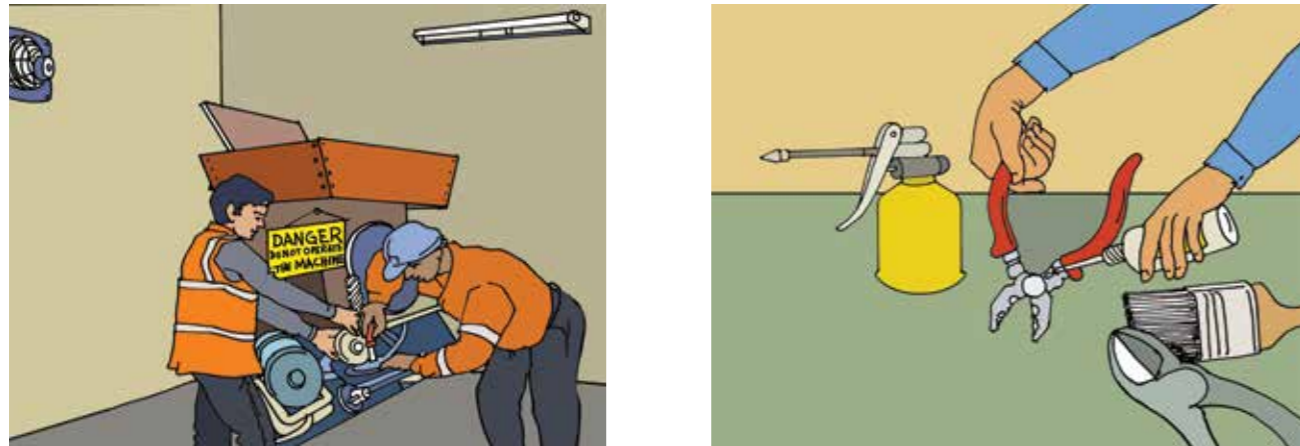


Figure 13. Regular maintenance of machines and tools keeps your workplace safe and productive.



Figure 14. Machine parts, tools and equipment should be checked and repaired by qualified and experienced persons.

CHECKPOINT 8

Ensure safe wiring connections for supplying electricity to equipment and lights.

Safe use of electricity is very important for e-waste workers. E-waste workplaces use and store many inflammable materials in a narrow area. An electrical short-circuit can quickly cause a big fire. The safe use of electricity is required to protect you, your family and colleagues. All electrical wires should be well-protected and sheathed. Pay attention to the junctions connecting electrical wires and machines. The junctions often cause electrical leakage.

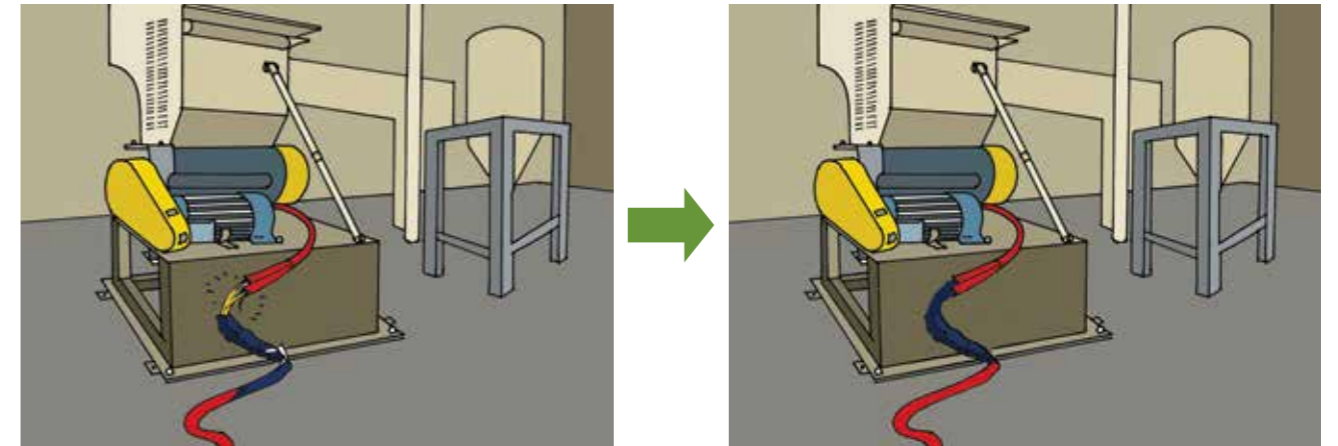


Figure 15. Check all electrical junctions. Fix with an electrical adhesive tape. Do not leave any junctions uncovered.

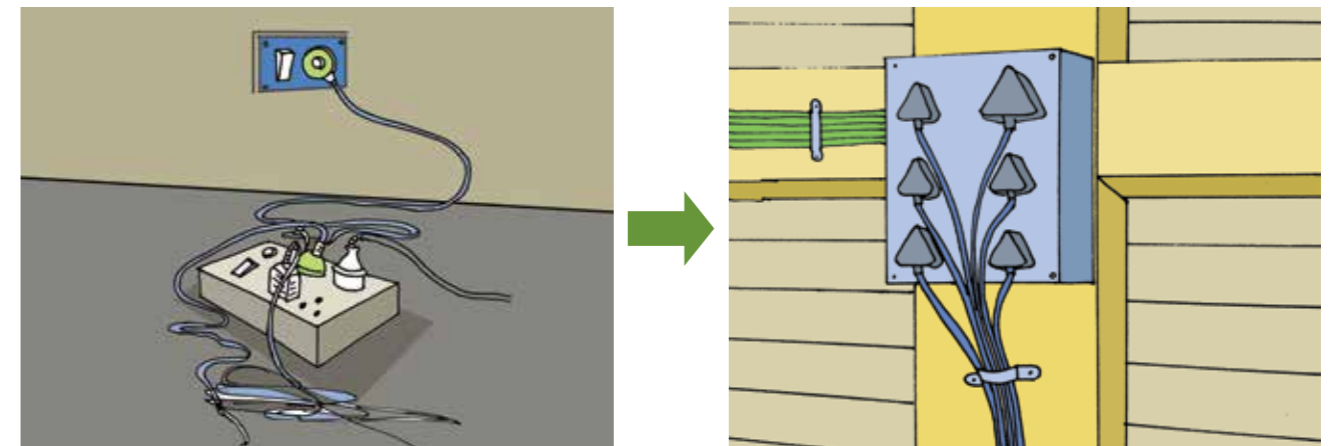


Figure 16. Ensure safe wiring connection for supplying electricity to equipment and lights.

CHECKPOINT 9

Add more daylight and keep windows and skylights clean.

Bright and pleasant work environments make the work of e-waste workers safe and productive. There are numerous merits in a bright work environment, such as fewer mistakes, smaller accident risks, less eye strain and better work postures (less bending), etc. In winter or in cold work environments, daylight makes your workplace warmer. To make the work environment brighter, e-waste workers should use daylight effectively. Daylight is free and you can save your electricity bills. Keep skylights and windows clean to allow more daylight in. Daylight also reduces moisture and kills termites in your workplace.

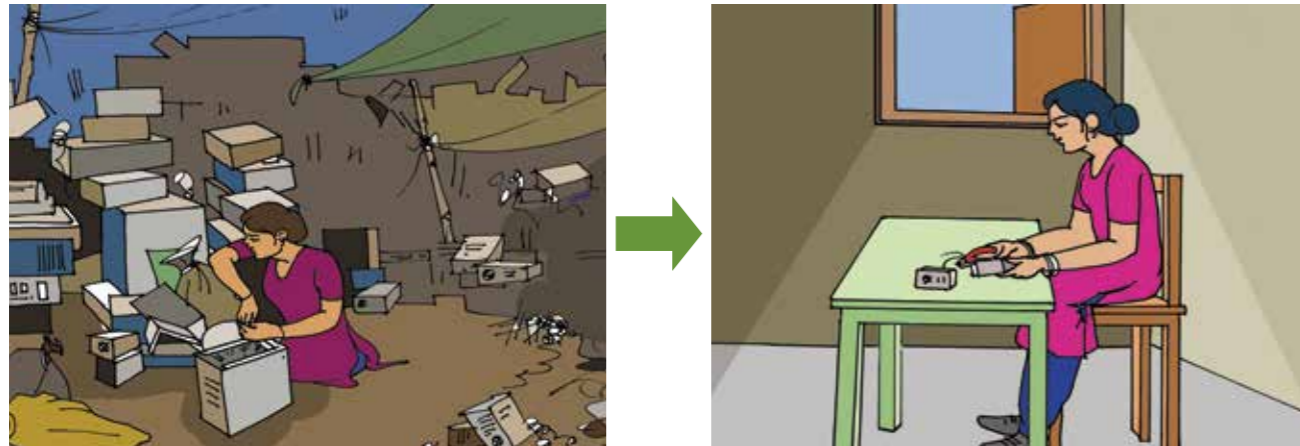


Figure 17. Add more daylight for lighting up the workplace.



Figure 18. Clean windows for more daylight coming inside.



Figure 19. Use local task lights to ensure sufficient brightness necessary for work.

CHECKPOINT 10

Isolate the sources of dust, hazardous chemicals, noise or heat from the e-waste workplace.

E-waste workers need practical ways to control dust, chemicals, noise or heat sources at low-cost. Dusty work environments, the strong smell of chemicals, loud noise and excessive heat will interrupt workers' attention to their work and increase accident risks. Everyday exposure to these hazards will gradually damage your health. The best solution is to isolate these hazard sources from the workplace. Another practical method is to enclose or screen the sources of dust, chemicals, noise and heat. These isolation measures enhance health and productivity of e-waste workers.



Figure 20. Store hazardous chemicals outside work areas with a firm lock.



Figure 21. Do not burn e-waste materials.

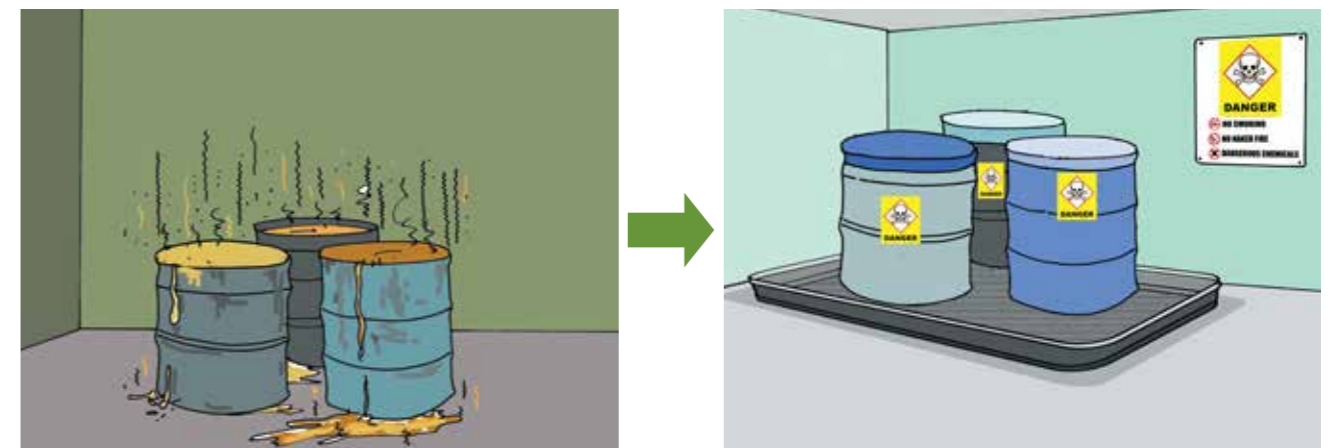


Figure 22. Chemical cans stand on a platform with secure lids to block evaporation and prevent pollution.

CHECKPOINT 11

Increase natural ventilation by having more openings, windows or open doorways.

Narrow e-waste workplaces with poor ventilation can easily accumulate heat, dust and polluted air. Many e-waste workers spend many hours a day in indoor climates. Both workers and their family members will be adversely affected. A poorly ventilated environment is especially harmful to older people and children. When it is hot, increase the natural air flow. More openings, windows and doorways increase natural ventilation and make your workplaces comfortable and pleasant. Adequate monitoring should be conducted in the e-waste workplaces to ensure that dust and emissions are within national standards and other available guidelines. These practical improvements are possible at low-cost. You will be surprised at the positive effects on health and productivity.



Figure 23. Open windows to increase the use of natural ventilation to improve the indoor climate.

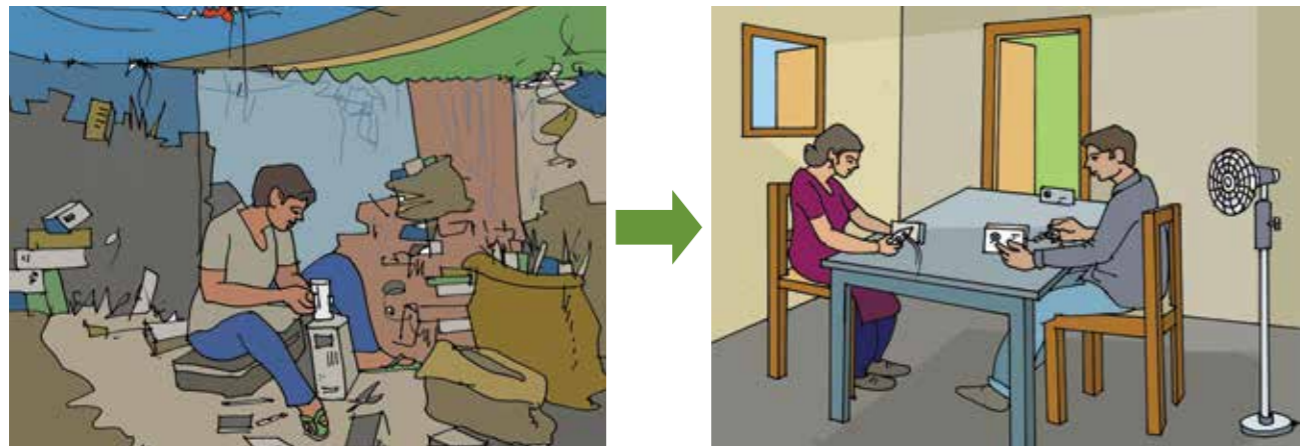


Figure 24. Select the most ventilated area to install the work station. Place the table near the window for good air flow.

CHECKPOINT 12

Provide adequate clothes and personal protective equipment such as glasses, masks, shoes and gloves.

E-waste workers handling hazardous materials need adequate clothes and personal protective equipment such as glasses, masks, shoes and gloves. They protect your body from hazardous materials. Select adequate personal protective equipment, and use them properly. Otherwise, e-waste workers will misunderstand they are well protected when in fact they are not. While using personal protective equipment, e-waste workers need to continue their efforts to isolate hazard sources.



Figure 25. Wear gloves, masks with filters, and long-sleeved shirts when using hazardous chemicals.



Figure 26. Use appropriate shoes, gloves and other protective devices.



Figure 27. Maintain personal protective devices in an orderly way. Clean and renew them regularly.

CHECKPOINT 13

Provide at least two unobstructed exits from rooms and enough fire extinguishers.

E-waste workplaces need a plan for practical fire prevention and emergency evacuation. E-waste workplaces often keep flammable materials in their narrow space, and it is easy to have a fire. The fire can spread quickly to all work areas once it begins. There should be a sufficient number of fire extinguishers. Let everyone know how to use them. Every work area has to clearly indicate at least two unobstructed exits for emergency evacuation. If your workplaces are on the second or higher floors, in addition to the routine transport route, secure an additional escape route. For example, an emergency ladder through the balcony, etc. is needed. These arrangements will save your lives and those of your friends and family members.



Figure 28. Provide enough fire extinguishers within easy reach and be sure that all e-waste workers in your workplace know how to use them.

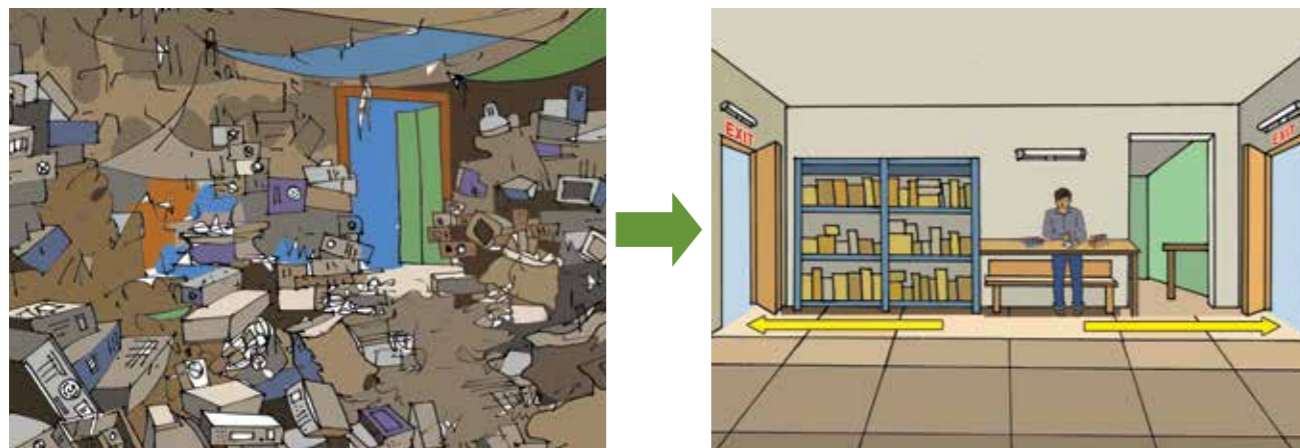


Figure 29. Mark emergency evacuation routes and exits to ensure quick evacuation for e-waste workers. Provide at least two unobstructed exits for emergency.

CHECKPOINT 14

Provide an adequate supply of safe drinking water in the e-waste workplace.

E-waste workers need safe drinking water when they work. Especially in a hot environment, you can easily lose water from your body and become thirsty. This increases fatigue and lowers productivity. Keep drinking water close to you for regular sufficient water intake. You will also save time when getting a drink. Select hygienic and convenient places to keep drinking water. The places should be away from toilets, chemical storage or dangerous machines. Your water should not be contaminated with dust, chemicals or other hazardous substances.

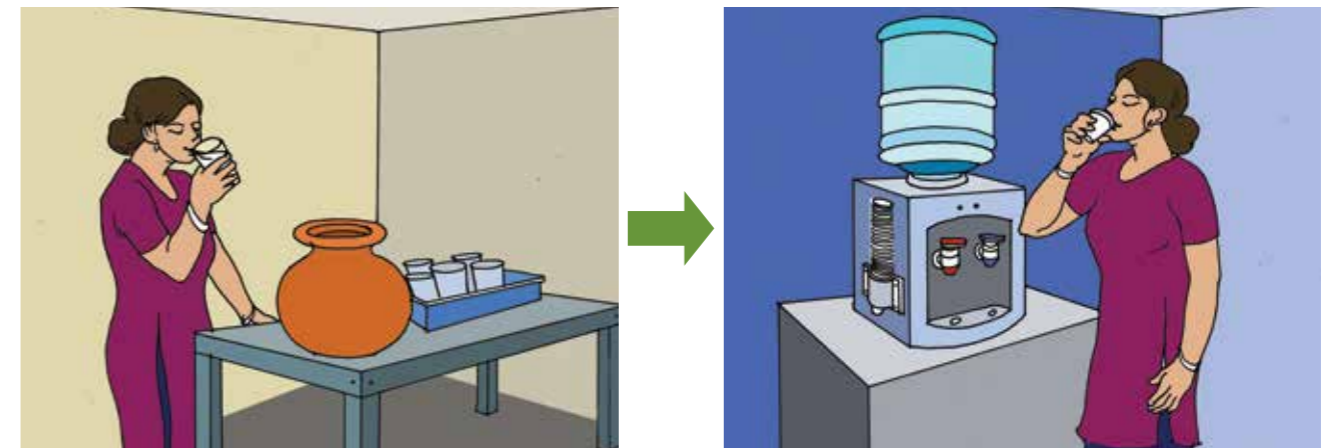


Figure 30. E-waste workers should have easy access to safe drinking water in the workplace all the time.



Figure 31. There are various ways to provide safe drinking water. Drinking water must be filtered and boiled to avoid contamination.

CHECKPOINT 15

Provide clean toilets and washing facilities close to the work area.

Clean toilets and washing facilities are an essential requirement for creating a hygienic and comfortable working environment for e-waste workers. Toilets should be located close to, but a little isolated from, the work area for comfortable access by workers. Clean separate toilets for men and women should be provided. Washing facilities near the work area help e-waste workers regularly clean their hands and other parts of their bodies. Workers using chemicals and other dangerous substances have to regularly wash out these substances to avoid skin absorption and to prevent them eating meals with contaminated hands.



Figure 32. Appropriate washing facilities with soap are essential for all e-waste workers.



Figure 33. An enclosed, low-cost bathroom refreshes e-waste workers after their hard work.



Figure 34. Clean toilets regularly to create hygienic working and living environments.

CHECKPOINT 16

Provide a separate hygienic place for eating meals and a resting facility.

E-waste workers should not have meals at the workplace to avoid any contact with dirt, dust or dangerous substances used during the work process. Your eating places and living quarters have to be separate from the work area. Spending short breaks in comfortable resting corners refreshes you and facilitates recovery from fatigue. You can work more efficiently after good breaks. Find a space and set a chair for resting. Come out from the workplace for a moment.



Figure 35. Provide a hygienic place for preparing and eating meals separate from your e-waste workplaces.

Figure 36. E-waste workers can enjoy pleasant conversation in a separate resting facility.



CHECKPOINT 17

Provide first-aid equipment and train qualified first-aiders.

In case of an accident and emergency, appropriate first-aid could save the life of e-waste workers. A practical emergency plan is needed including provision of first-aid equipment near the e-waste workplace and the smooth transfer of accident victims to the nearby hospital. E-waste workers should have adequate number of trained first-aiders among themselves to cover all work areas. The first-aiders regularly check the contents of the first-aid equipment. In an emergency, they provide patients with first treatment before being transferred to the hospital.



Figure 37. Provide first-aid equipment in an easy-to-see place.



Figure 38. Train adequate number of qualified first-aiders among e-waste workers.

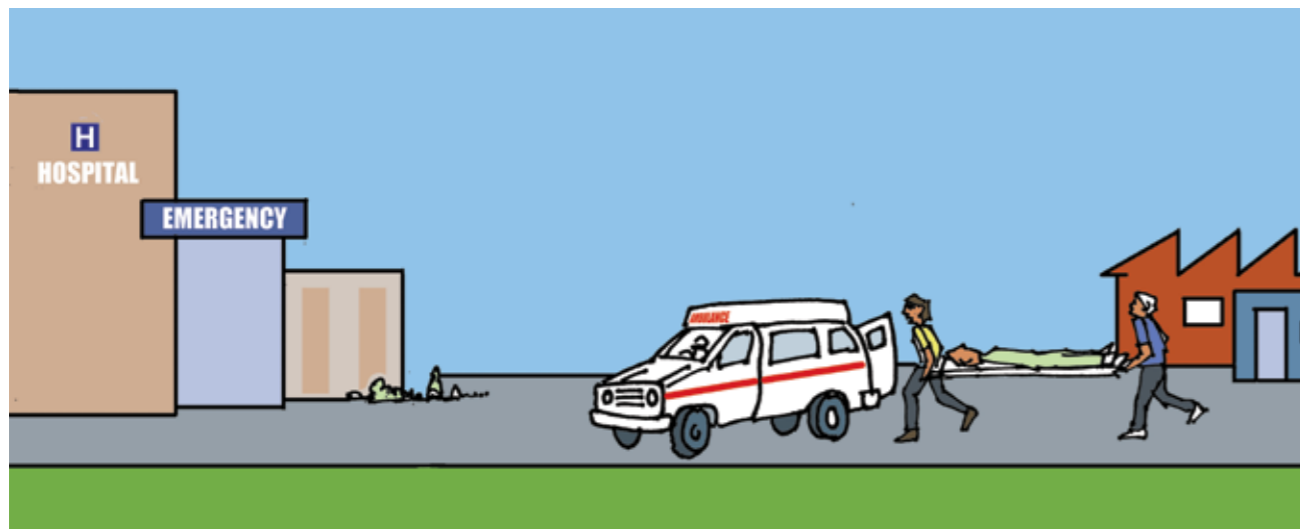


Figure 39. Prepare an emergency plan to transfer patients to the nearby hospital.

CHECKPOINT 18

Combine tasks so that each e-waste worker can perform varied and interesting work.

Doing the same task everyday is boring. Though monotonous, repetitive work looks easy to perform, actually e-waste workers could experience boredom, increase mistakes, and produce a lower quality product. Also, repetitive motions will easily cause strains and pains in muscles which are repeatedly used. Doing a variety of tasks would keep e-waste workers alert and productive. Combine tasks so that each worker can perform varied and interesting work. This experience will assist them in acquiring better job skills and ideas on how to complete their product in a more systematic way.

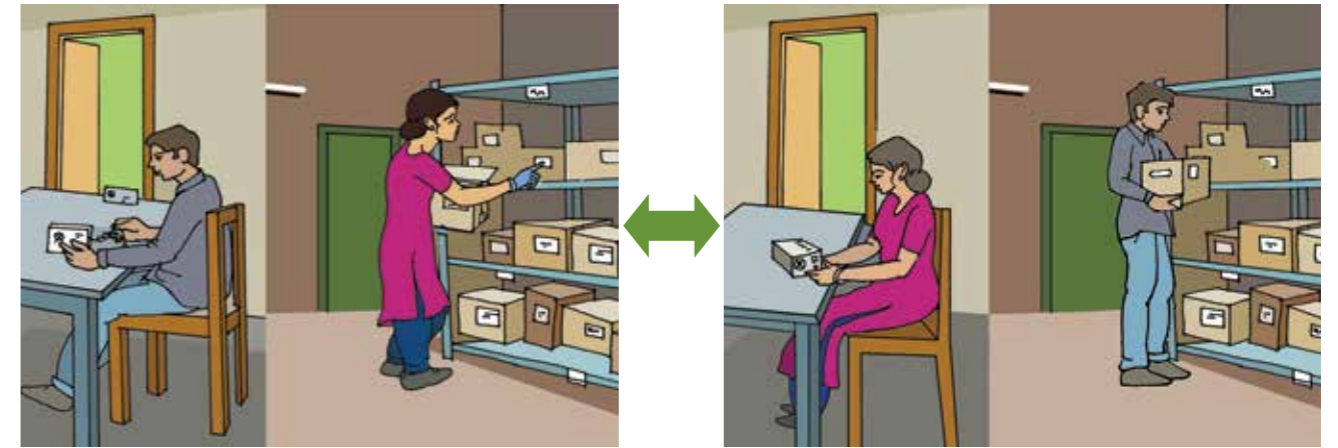


Figure 40. Combine tasks to make the e-waste work more interesting and varied.



Figure 41. Provide short breaks during e-waste work to recover from fatigue and refresh workers.



Figure 42. Encourage e-waste workers to exchange ideas for improving safety, health and productivity and making work more varied and interesting.

CHECKPOINT 19

Train e-waste workers for safe and efficient operation.

Training and retraining of e-waste workers in safe and efficient operation are an indispensable part of daily production. Adequate safety and health training should be provided to all e-waste workers, including induction training for new and young workers, refresher training for experienced e-waste workers, and mock drills and evacuation drills for emergencies. Training programmes need to be practical so that all e-waste workers can understand the safety and health risks in their e-waste work and know how to reduce the risks. Conduct pre-employment and regular health checks for e-waste workers to ensure there are no adverse impacts on their health.



Figure 43. Prepare practical training programmes involving all e-waste workers. Use good examples, pictures, videos, and demonstrations.



Figure 44. Provide young and new e-waste workers induction training. Ensure only adult workers are hired and no child labour used.

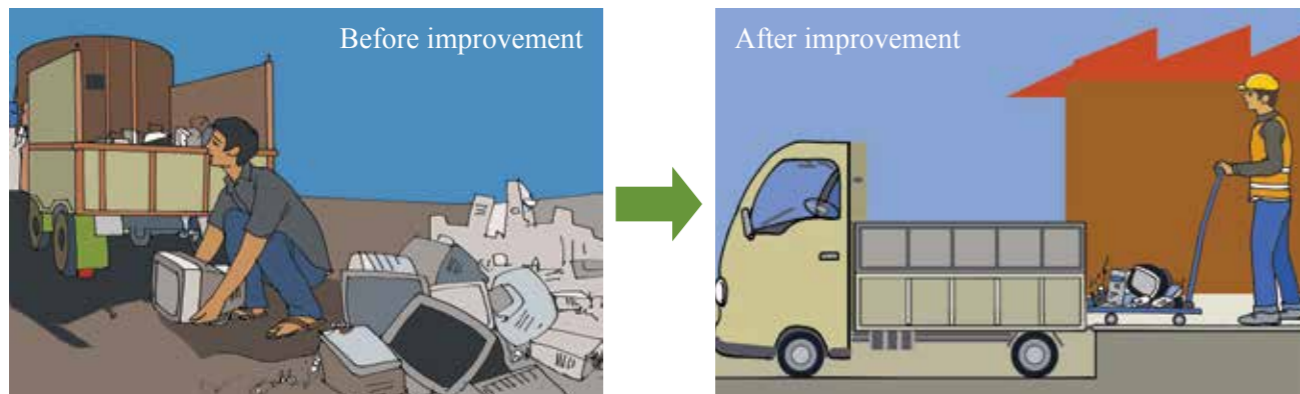


Figure 45. Encourage e-waste workers to make improvement proposals after training and implement them.

WISH Programme

E-waste (electrical and electronic waste) workers are contributing to the socio-economic development through their collecting, dismantling, disposing and recycling work. They are exposed to many safety and health hazards and risks arising from their work, such as carrying heavy waste materials, exposure to heat, dust, and hazardous chemicals, working in narrow workplaces in strenuous postures, unsafe use of electricity and machinery, and long and irregular working hours. Most of e-waste workplaces are in the informal sector and workers rarely receive adequate protection. Workers need practical support to make their workplaces safer, healthier and more productive.

This manual aims to assist e-waste workers in improving their safety, health and working conditions. The manual shows many low-cost ideas that e-waste workers can easily adopt by using locally-available materials. The ideas are also useful for improving productivity and efficiency at their e-waste workplaces and can support the growth and sustainability of their businesses.



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