

## ***[E-waste: The Bangladesh Situation]***

In Bangladesh, there is a growing concern about the increasing amount of electronic or e-waste being consumed and disposed of. *E-waste and the associated recycling processes can cause significant environmental and health hazards. At present, there is a lack of awareness about the hazards of electronic waste (or e-waste) in Bangladesh. "Do we know what happens when we throw out our old electronic devices? Probably not, but considering they contain both toxic chemicals and heavy metals we'd think someone would know?"*

# Study Report; E-waste: Bangladesh Situation

## *Study report on* ***E-waste: Bangladesh Situation***

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## Acronym and Abbreviation

<b>Acronym/ Abbreviated Term</b>	<b>Full Meaning</b>
Cd	Cadmium
CFL	Compact Fluorescence Light
Cr	Chromium
DoE	Department of Environment
ESDO	Environment and Social Development Organization
E-waste	Electronic Waste
Hg	Mercury
Pb	Lead
POPs	Persistent Organic Pollutant
UNDP	United Nations Development Program
IPEN	International POPs Elimination Network
UNEP	United Nations Environment Program
MoEF	Ministry of Environment and Forest

# Study Report; E-waste: Bangladesh Situation

## 1. Introduction

In recent years, as a result of increasing access to technology and the rapid growth of the Bangladesh economy, a market has emerged for computers, consumer electrics and home appliances. This emerging market has seen an increase in the amount of local consumer electronics products in the market and as a result an increase in the level of equipment that is being disposed of. In Bangladesh, this electronic waste is reused, broken down for parts or thrown out completely. Currently this informal practice is not being carried out safely and has become a danger to human health and the surrounding environment. At present there is a lack of awareness about the issue in the general population, in the Government and also in private companies.

ESDO has been conducted a research survey in order to address this problem and to create mass awareness and learning initiative on e-waste through a project focusing Dhaka and Chittagong city.

This research report has been written based primary data as well as based on the secondary sources of information. This report will give an idea of present situation analysis, gaps and recommendations for way forward.

“Do we know what happens when we throw out our old electronic devices? Probably not, but considering they contain both toxic chemicals and heavy metals we'd think someone would know”?

### 1.1. What is E-waste?

"Electronic waste (E-waste)" may be defined as all secondary electronic goods including computers, entertainment device electronics, phone sets / mobile phones, and other items such as television sets and refrigerators, whether sold, donated, or discarded by their original owners. E-waste is a popular, informal name for electronic products nearing the end of their "useful life." Computers, televisions, VCRs, stereos, copiers, and fax machines are common electronic products. Many of these products can be reused, refurbished, or recycled. Unfortunately, electronic discards is one of the growing segments of our nation's waste stream.

E-waste containing products	Heavy metals & toxic substance release from e-waste
<ul style="list-style-type: none"><li>• Televisions and computer monitors,</li><li>• Computers and computer peripherals (e.g. monitors and key boards),</li><li>• Audio and stereo equipments</li><li>• VCRs and DVD players,</li><li>• CFL bulbs,</li><li>• Video cameras,</li><li>• Telephones, cellular phones and other wireless devices,</li><li>• Fax and copy machines,</li><li>• Video game consoles,</li><li>• Medical and dental equipments etc.</li></ul>	<ul style="list-style-type: none"><li>• Mercury</li><li>• Lead</li><li>• Cadmium</li><li>• Zinc</li><li>• Chromium</li></ul>

## 2. Study

ESDO commenced a study focusing Dhaka city, to examine the trend of usage of electronic devices /gadgets and what's been done during end of these equipments, what hazards are been created from these e-waste, what are the current practice of dumping and what rules are there for dumping these sludge. Finally this study has tried to identify the level of awareness regarding these e-waste and way forward to reduce environmental hazards.

### 2.1 Objective of the study

1. To identify the total volume of e-waste which has been generated in Bangladesh from 1971 to 2010 (June).
2. To analyze the management system of dumping of e- waste.
3. To describe the impact of e-waste on environment and health in Bangladesh.
4. To stop e-waste generation through a policy and law.
5. To educate and aware the users about the hazards of e-waste associated with computer technology.

### 2.2 Methodology of the Study

ESDO has conducted survey in (September 2009-June 2010) in Dhaka, capital of Bangladesh on the volume of e-waste generation of six products among at least four target groups of each one. Each group consisted of 10 members except mobile set. In case of mobile phone group consists of 30 members. Six products are television, computer, mobile, CFL bulb, medical and dental equipments. Target groups were importers, retailers, repairers and users of each product.

## 3. Findings of the study and analysis: Snap shot of present practices of these six products

### 3.1.1 Brief Findings

Every year Bangladesh generates roughly 2.7 million metric tons of e-waste. This electronic waste is disposed without understanding the harmful effects of dumping this waste in to open landfills, farming land and open bodies of water.

- Health impacts: Cancer, Asthma, Nerves breakdown, Hearing problem, Visual problem, Infant-mortality, disable baby birth.
- Environmental impacts: Air pollution, Water pollution, Land pollution and life threat for wildlife.
- In Bangladesh every year more than 15% of child workers die as a result of e-waste recycling and more than 83% are exposed by toxics substances and become sick and are forced to live with long term illness. According to ESDO's recent study and available information, approximately (50,000) fifty thousand children are involved in the informal e-waste collection and recycling process, amongst them about 40% are involved in ship breaking yards.
- E-waste generated from ship breaking yards alone accounts for more than 2.5 million metric tons of toxics e-waste each year.

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- Bangladesh has generated 6233.04 metric tons of toxic e-waste in cell phones alone in the last 10 years.
- Every year approximately 181,896 metric tons of e-waste generated from TV.

### 3.2 Televisions

ESDO conducted the survey in a stadium market, the largest market for televisions amongst 10 importers as sample.

#### Volume of e-waste from televisions

There are no manufacturers of televisions in Bangladesh, only assemblers. Essentially the parties involved in televisions in this country are importers, retailers or repairers. While surveying, most of the importers introduced themselves as retailers and repairers as well importers. They did not admit to being assemblers, but a variety of television sets were stored inside the stores, despite brand name signboards being present.



To understand the present scenario regarding e-waste in this country; an estimation is required to measure the total volume of e-waste since 1971. To make a simple estimate based on averages, a ten year sample has been selected.

In 1981 the urban population of Bangladesh represented 18% of the total population of the country. Television was originally introduced to Bangladesh in 1964, color television in 1984. The TV users of that time were almost entirely urban dwellers. Remarkably, TV license holders made up just 7% of urban population. Based on the presumption of a lifespan of a television of 5 to 10 years, we can predict that from 1971 to 1981 around 50% of televisions purchased (estimation) could be contributing to 'e-waste'. So, we can deduce from this that in 1981 the volume of e-waste from televisions would have been equivalent to 8,500 Metric tons (@ of 1 set =15 kg) based on around 566,445 total television sets.

In 1991 the growth rate of the urban population had not increased, i.e. 18% like last 10 yrs, but the rate of television ownership and the rate of television obsolescence increased. The volume of televisions turned into e-waste is estimated to be 962,973. (And if we extrapolate these figures, then in 2001 the figure is 3,258,582 and in June 2010 the number is 7,334,255). These figures have been counted based on growth rate of urban population and TV users per year. So, therefore, the total volume of e-waste can be estimated to be 181,834 Metric tons per year from television.

#### Re-use or re-cycling growth

ESDO's survey report shows that 8 Importers out of 10 import parts for non-brand television sets. Namely - Walton, My One, Konka, G. Hanzs, Esquire, TCL, Haier from China and Malaysia. 60% of importers assemble these televisions in their factories. The



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warranties of the most of the TV sets are 5 to 10 years. These 8 importers sell approximately 670 TV sets per year.

Of the 8 retailers, they mostly sold low cost, unknown brand televisions to their customers, such as – SMY, Walton, Tristar, Nova, My One, China, Esquire, TCL, Haier. Approximately 20% of retailers sell around 1500 TV sets in a year.

Based on the income capacity of most customers, they will most often purchase unknown brand televisions and the expected lifespan of these sets is no more than 3 - 5 yrs.

Assemblers, repairers and customers don't know which heavy metals contain in a television set. And thus they are unaware of e-waste and dumping of it.

### Disposal and re-use practices

According to the survey, about 50% of assembler companies sold their e-waste, 30% is dumped in landfill of any description and 20% are put in long term storage. 30% of repairers stored the old and damaged TV sets for repair and further use, 15% were dumped and 5% chose not to respond. Among the customers surveyed, 40% sold their old sets to the repairers, 10% were dumped and 20% reused their sets after repairing them.

The survey can give us a basic picture of television e-waste in Dhaka city.

### 3.3. Computers (Laptops and Desktops)

ESDO conducted a survey in IDB Bhaban, the largest computer market in Dhaka, using 10 importers as a sample group. This information was gathered to identify the use and re-use rate of PCs and laptops.

There are no computers manufacturers in Bangladesh, there are only computer assemblers. Those who are involved in the computer trade are either they are importers or retailers or repairers.

### Volume of e-waste from computers

In Bangladesh computers were introduced to the general population in the early 1980s.

The computer users of that time were almost exclusively urban dwellers. If we assume the lifespan of the average computer is 3 to 5 years, then we can estimate that between 1980 and 1990 around 50% of computers purchased (estimate) can be counted as disposed items of 'e-waste'. From this figure, we can assume that up to 1990 the volume of e-waste generated from PCs and laptops was around 100,309 items.





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In 2000 the growth rate of urban population of Bangladesh was 27% and as a result, computer usage and disposal rates had increased. The volume of computers relegated to e-waste was 399,010. Consequently, in 2010 the volume of e-waste of computers is estimated to be around 1,604,368 units. These figures have been calculated based on the growth rate of the urban population and computer users per person per year. So, the total volume of e-waste from computers after 1980 up to current time is 2,103,687 units in total and e-waste is 0.0252 million metric tons (@ of 1 set = 12 kg).

ESDO's survey report shows that 20% of importers import non-brand computers (e.g. Mercury and Havit from China and Taiwan.) Warranties for most of these devices are 3 to 5 years. According to our survey, 10% of cyber cafés in Dhaka use Mercury brand.

40% of assemblers buy different computer parts from used computers. 90% of assembler buy used computers. After reusing these parts to create refurbished computers, 80% of assemblers will guarantee a 1 year warranty.

### Disposal practices

Assemblers buy parts from used computers and reuse them after repairing them and ensuring their warranty for 1 year.

Assemblers and repairers are unaware of the heavy metals and the toxins present in computer parts and thus they are unaware of the problem of disposal of e-waste.

All of the businesses questioned in the survey by ESDO buy used computers. A total of 60% assemblers dump their e-waste in storage and dustbins and 40% of repairers and 50% businesses dump their e-waste anywhere they can find.

### 3.4 Mobile phones



In Dhaka city ESDO conducted a survey at Eastern Plaza, one of the largest markets for the sale of mobile phones.

Retailers in this Dhaka are traditionally salespeople for a number of brands.

Most of the retailers sell Nokia, Sony Ericsson and Samsung purchased from Singapore, Dubai, Hungary. They also prefer to sell sets from China. They don't distinguish between brand and non-brand sets.

### Volume of e-waste generated by mobile phones

In Bangladesh, mobile phones were first introduced in 1989. There are six mobile providers in Bangladesh. Citycell, Grameenphone, Banglalink, Robi, Teletalk (govt.) and Airtel telecom. From 1990 to 2009 the combined subscribers of the six companies totaled 47,220,000. We can presume an increase of 10% in users till June 2010, therefore bringing the current total to approximately 51,942,000. Based on the presumption that the users will use on average 1-2 mobile phone sets during this time, the total number of handsets purchased could be estimated to be 103,884,000. Since the lifetime of a mobile set is on average approximately a 1 year, it can be said that in last 10 years approximately

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31,165,200 mobile phones (estimate) have been contributing to 'e-waste'. 80% mobile set (estimated) would be counted as rejected sets which had been produced e-waste. Therefore, it can be estimated from 2000 to till June 2010 the volume of e-waste from mobile phones is around 24,932,160 units and e-waste is 6233.04 metric tons (@ of 1 unit = 250 g)

ESDO's survey report shows that 9 importers out of 30 import mobile phones from China. 6 importers out of the 30 surveyed import from 150 - 1200 mobile phones per month. 6 importers surveyed sell between 150 to 1000 mobile phones per month.

Both branded and non-branded mobile phones have a warranty for 1 year and especially non brand sets are generating e-waste

### Disposal Practices

Our survey revealed that repairers and customers are unaware which heavy metals and toxins are contained in mobile handsets and thus are unaware of the problem of e-waste disposal. 73% of repairers disposed of their rejected mobile phones in storerooms, while 40% of consumers disposed of their handsets anywhere and everywhere, including their homes.

### 3.5 CFL and Mercury Bulb

ESDO conducted a survey amongst a variety of Compact Fluorescent Lamp (CFL) bulb purchasers to determine whether there was any system in place.

In Bangladesh, CFL bulbs were introduced at least as early as 2005 by Transcom Electronics Ltd. Up until 2010 the production of CFL by the Transcom Ltd. was 3,200,000 bulbs. The lifetime of a CFL bulb is rarely greater than 18 months. Therefore, it can be said that in last 5 years the number of disposed bulbs generated by Transcom was 5,253,313. There are also six other companies that produce CFL bulbs in Dhaka city (e.g. Energy Pac, Osaka, Onik, Delta, SKS and Rangs.) Therefore, it can be estimated that till June 2010 the volume of e-waste from CFL bulbs is around 9,455,964.



### Volume of E-waste by CFL and mercury bulb

According to the census of 2001 the number of household in municipalities was 1,934,000. In the last 10 years, each household used at least 3 mercury bulbs. So in last 10 years the volume of e-waste generated from CFL and Mercury bulbs is 96,485,694.

Name of the companies	Yearly production (2009-2010, up to June ) combined with last five year production (in per unit)	Yearly generated e-waste (2009-2010, up to June ) combined with last five years production (In metric ton)
Transcom	3200,000	314.95
Energy pack	1600,000	157.47
Other companies(Osaka, Onik, Delta, SKS, Rangs)	960,000	94.48
<b>Total</b>	<b>57,60,000</b>	<b>566.90</b>

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### Mercury /tube bulb:

Category	No. of used mercury bulb 2001 - 2010 (June) (In per unit)	No of generated e-waste 2001-2010 (June) (In metric ton)
Household	1453810	286.17
Industrial sector	80,02,114	1575.15
<b>Total</b>	<b>9455942</b>	<b>1861.32</b>

### Disposal Practices

Consumers are generally unaware of the toxic contents of CFL tubes. 50% of customers dispose of the bulbs in the general garbage.

### 3.6 Thermometers

In Bangladesh, the thermometer is a widely used piece of medical equipment in most households. This is especially true in urban areas, where it is expected that each household would purchase one thermometer per year.

Since 1971 to 2010 (June) urban households are 61,02,95,237. Since the longevity of a thermometer is 1 year, so from 1971 to 2010 about 61,02,95,237 pieces thermometers have already been rejected after using. So, the volumes of E-wastes are 8513.59 metric tons.

**Table 3: Generation of e-waste from thermometer**

Year	Used thermometer (ten years) (In per unit)	E- waste (ten years) (in metric ton)
1971	3,3615,120	497.06
1971-81	8,0920,800	1194.64
1981-91	10,0309,667	1296.88
1991-2001	16,6254,182	2357.43
2001-2010	22,9195,469	3167.64
<b>Total (in 50 years)</b>	<b>61,02,95,238</b>	<b>8513.59</b>

### 3.7 Other medical and dental equipment

The availability and access to health services in Bangladesh is poor and less than 40% of the population receives primary health care. According to the World Health Organization, in 2000 there were just 29,746 doctors in Bangladesh or just one doctor per 4,521 people. (Reference: Country Health Profile, Bangladesh, WHO Regional office for south-east asia, w3.who.org) In 2003, total expenditure on health was just 1.1% of GDP.

The government has made efforts to improve the health system by implementing initiatives such as the Primary Health Care approach, adopted by the Ministry of Health and Family Welfare in 1988. Due to limited government funds, the Primary Health Care system covers just 12 areas, reaching 48 million people which are less than 40% of the population.

**Sources:** *Human Development Report 2006, UNDP, World Health Organization, UNEP, ESDO baseline survey*

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According to the census report 2001 the registered physician of Bangladesh is 32278. And according to Bangladesh Medical and Dental Council report last 10 years it can be increased 30% i.e. 41961. If each doctor used 10 medical equipments, therefore since 1971 to 2010 medical equipments are used 4,19,610. Since the lifetime of these equipments are not more than 5 years, so last 10 years rejected equipments have been 1,67,844 (estimated) for each doctor.

According to census report 2001 government hospitals are 660. So it may be 726 till 2010. Each government hospital uses at least 30 equipments, so till 2010 the number of used equipments was 21780. In last 10 years rejected equipments are 13068. Last 10 years the rejected equipments in private clinics were 12870. So we can say last 10 years in medical sector the volume of e-waste is 1,93,782. In dental sector e-waste may be 5813. In total the volume of medical e-waste is 199595.

### Dumping practice

According to the survey report of ESDO about 30% doctors, 90% clinic and hospital and 50% dentist dump the e-waste in store.

Among the all above mentioned electronic elements most of the e-waste generated from medical equipments with thermometers. The volume of e-waste of it is including thermometer 61,04,94,832.

### **3.8 Analysis of the findings:**

Deriving data from all sources, we estimate that e-waste generated in Bangladesh each year can be summarized like this;

Sources of e-waste	Estimated e-waste
Ship Breaking Yards	2.5 million metric ton/yr (2500000 metric ton/yr)
Television Sets	0.182 million metric ton/yr (181896 metric ton/yr)
Computers	0.0084 million metric ton/yr (25244.24 metric ton/30yrs)
Mobile Phones	0.0006 million metric ton/yr (6233.04 metric ton/10yrs)
CFL Bulbs	0.0001 million metric ton/yr (566.90 metric ton/6yrs)
Mercury Bulbs	0.0018 million metric ton/yr (1861.32 metric ton/10yrs)
Thermometers	0.0002 million metric ton/yr (8513.59 metric ton/50yrs)
Other Medical & Dental Waste	0.009 million metric ton/yr (93478.25 metric ton/10yrs)
<b>Total</b>	<b>2.702 million metric tons/yr</b>

According to yearly generation figures, the proportion of E-wastes can be showed by the following graphical representation, where it is too clear that ship breaking yard occupied highest position. This sector poses us to be an alarming state. Wastes from television sets have taken the second highest position with an exponentially increasing rate.

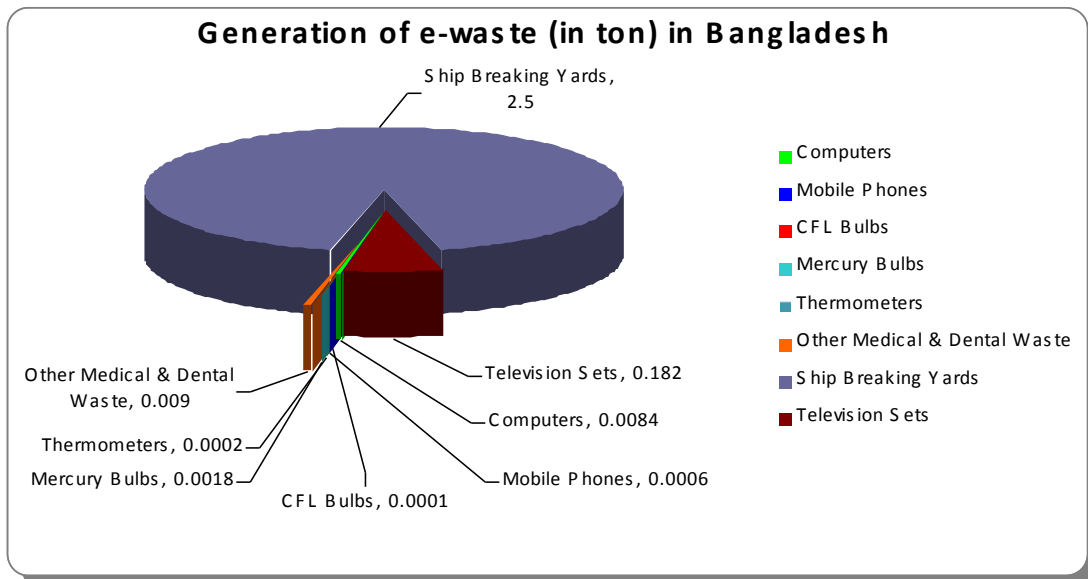


Figure-1: Graphical presentation of E-waste scenario (ton/ year) of Bangladesh

### 3.8.1 Overall trend of consumption of electronic goods and disposal practice in Bangladesh

Bangladesh is developing with the increasing of technology usage. Sustainable and safe use of technology can drive an economically developed country. But the wastes from these electronic goods come to us as curse. We consume and dump the useless products without any consideration of environmental benefits and sustainability. From the survey report, it is clear that Bangladesh is improving in IT, media and telecommunication sectors. These lead us to the contamination due to the heavy metals and other hazardous chemicals.

### 3.8.2 Electronic products, consumption and trade in Bangladesh

- The country's electrical manufacturers are now producing 80 per cent of electrical products against a total demand in local markets of approximately BDT 30 million.
- According to BEMMA, 3.2 million tons of electronic products are consumed per year in Bangladesh.

Every year Bangladesh generates roughly 2.7 million metric tons of e-waste. The safe disposal of these products is not being undertaken and without understanding the harmful effects of the incorrect disposal of e-waste, this has been dumped in to open landfill, farming land and open bodies of water. Unfortunately the whereabouts of millions of tons of e-waste generated each year in Bangladesh is largely unknown. The volume of e-waste - computers, phones and televisions - being discarded every year is growing rapidly.





### 4. E-waste status in Bangladesh

When the earlier mentioned heavy metals and trash electronic items are dismantled without following effective controls in place, the hazardous compounds get released which affects human health and the environment adversely.

More than 30 million children, women and non-formal workers are exposed to heavy metals, lead, mercury, cadmium, zinc and chromium, PCB, Dioxin and furan by the incorrect disposal of this e-waste.

Components which are not biodegradable or cannot be recycled are dumped or burned in open those release toxic substance into the environment.

#### 4.1 E-waste generated in Bangladesh

No inventory has been made to assess the extent of the e-waste problem in Bangladesh. The goods below all contribute to the volume of e-waste in Bangladesh.

- The total number of PCs, TVs and refrigerators purchased in the year 2006 was 600,000, 1,252,000 and 2,200,000 respectively.
- At year end 2008, the total number of TVs in use in Bangladesh was roughly 10.3 million. Every year around 12,122,550 TV sets become scrap and this equates to approximately 181838 metric tons of e-waste.
- The total number of active mobile phone subscribers in Bangladesh was 51,942,000 at the end of June 2010.
- Each year more than 2.7 million tons of electronic waste (including e-waste from 'ship breaking yards') is generated in Bangladesh.

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- E-waste generated from ship breaking yards is equivalent to approximately 2.5 million metric tons per year.
- Persistent Organic Pollutant (POPs) that are generated from ship breaking sites: PCB, Dioxin, Furan.
- 6233.04 metric tons of e-waste has been generated from mobile phones within the last 10 years.
- Within the last 10 years, the computer sector has generated approximately 25244.24 metric tons of e-waste in Bangladesh.
- Our country's mobile phone penetration touched a record mark. Still a big market is untapped. We are creating a noticeable mobile phone density compared to those countries whose economic condition is better off than ours. We can easily guess on the basis of the number of subscribers that there are more than 50 million mobile phone sets in our country. Average longevity of a set is about one year. So, every year we are dumping over 25 million mobile phone sets.

We can presume on the basis of the number of subscribers in Bangladesh that there are more than 50 million mobile phone handsets in use in our country. The average longevity of a non branded handset is about one year, whereas a branded mobile handset is expected to last from 2 – 3 years. If non-branded mobile phones account for 60% of the market, therefore every year we can assume we are disposing of over 17 million mobile phones.

### 4.2 Specific Mercury containing products in Bangladesh:

Consumer products	Commercial products
<p><b>Home items:</b> Antiques, barometers, clothes irons, electronics, jewelry, lamps/light bulbs, light switches, paint(Latex), pesticides, security system, shoes, sporting equipment, television sets, thermometers, mirrors, washing machines, calculators, hearing aids, toys, pacemakers, watches, cloth irons, desktop liquid crystal display(LCD) monitors, laptop LCD monitors, neon lights, sewer pipes, sink traps, fire alarm boxes, television sets,</p> <p><b>Medical pharmaceutical products:</b> Antibiotics, contact lens solution, dental amalgam, sphygmomanometers, ear and eye drops/eye ointment, nasal spray, skin cream.</p> <p><b>Automotive parts:</b> Convenience light switches, heated car rear windows, some anti-lock braking system.</p>	<p><b>Medical products:</b> Antibiotics, batteries (medical use), alarms, blood analyzers, sphygmomanometers, pacemakers, pumps, scales, ultrasound, ventilators, gastrointestinal tubes, vaccines, hearing aids.</p> <p><b>Electric products:</b> Building security system, fire alarm box switches, laptop LCD monitors, pressure control, light switches, thermometers, generators, sphygmomanometers, computer monitor.</p> <p><b>Chemical products:</b> Acetic acid, ammonium, chloride, enzyme, sulfuric acid, ethanol</p>

### 4.3 E-waste concentration areas

In Dhaka the concentration or highest disposal /storage of E-waster are in Islampur, Kamrangirchar, Gingira, Mirpur (11, 12) and Mohammadpur etc.



### 5. Recycling and disposal of E-waste

The process of recycling in Bangladesh has the potential to be hazardous to the recycler's health. Currently, there are no proper waste management guidelines or regulations in place. Reuse of e-equipment is a common practice in Bangladesh. Equipment recycling and dismantling is a continually growing business, yet a formal recycling sector does not exist. All the recycling is being carried out by the informal sector. It is estimated that 120,000 urban poor from the informal sector are involved in the recycling trade chain in Dhaka city. 15% of the total waste generated in Dhaka (mainly inorganic) equates to 475 tons recycled daily. Of this amount, only 20% to 35% is recycled, while the remainder is disposed of in landfills, rivers, ponds, drains, lakes and open spaces.

### 6. Impacts due to the E- waste hazard:

#### 6.1 Environmental pollution

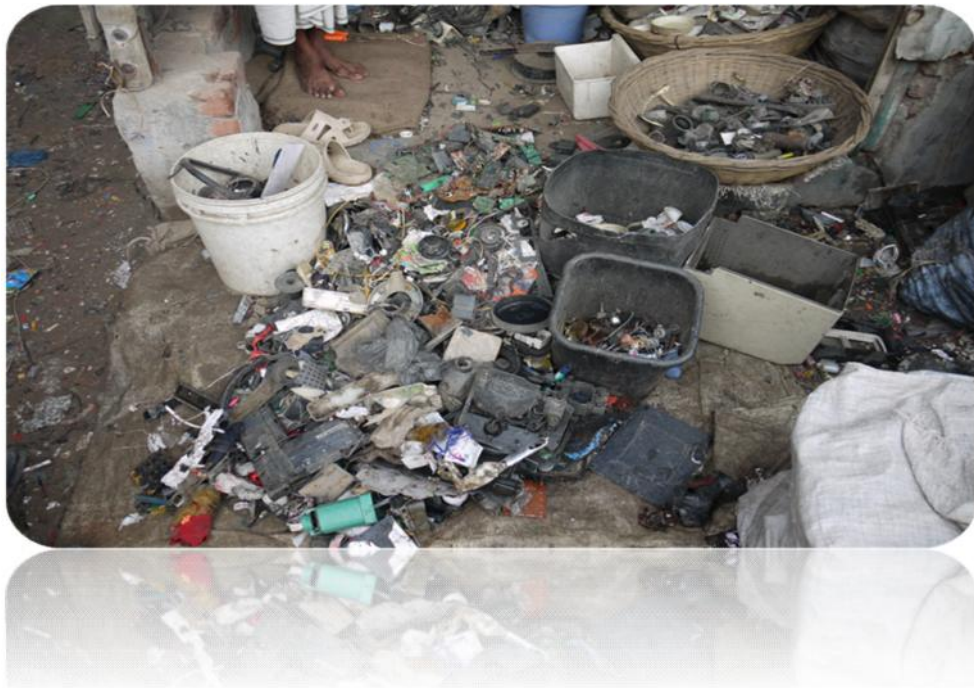
Disposal of e-waste without appropriate measures in place can cause damaging environmental pollution. A lack of awareness resulting from a lack of available information relating to the handling and recycling of these expired products can leave people exposed to health hazards. E-waste is threatening the soil content of our farming land and reducing the productivity of our crop land.

The problem develops if this e-waste is dumped in landfill sites or if is dumped illegally. There are no laws in place relating to the safe disposal of e-waste and there is no system or institution to monitor the dumping of electronic goods. If the parts are dumped in the waterways of Bangladesh, then the toxic chemicals are left to seep into the soil and the aquifer of water can be contaminated with lethal chemicals.

#### 6.2 Health hazards: (From e-waste containing mercury, lead, cadmium)

Mercury	Lead	Cadmium
Brain disorders, Kidney, renal and neurological damage, Leading to even death.	Learning disabilities, Mental retardation, Behavioral problems, Hearing impairment.	Lung damage, Fragility of bones, High blood pressure, Nerve and brain damage, Kidney and liver disease.

6.3 City E-waste retailers and recycling in Dhaka



### 7. Policy regime:

#### 7.1 Law:

- ❖ Bangladesh adopted its National Environment Policy in the year of 1992 highlighting the regulating all activities that pollute and destroy the environment.
- ❖ No specific law or ordinance for e-waste management and recycling. But we have Bangladesh Environment Conservation Act, 1995, The Environmental Court Act, 2000, and The Environmental Conservation Rules, 1997.
- ❖ The Environment conservation act, 1995 authorize the Director General to undertake any activity necessary to conserve and enhance the quality of environment and to control, prevent and mitigate pollution.
- ❖ Medical Waste Management Rules, 2008 addresses the waste management issues for the medical sector including E-waste.
- ❖ No regulations specifically dealing with E-waste in Bangladesh.
- ❖ Government already prepared draft National 3R (Reduce, Reuse and Recycle) Strategy and in that draft e-waste issues were addressed.
- ❖ Hazardous Waste Management Rules is under preparation and still time to incorporate E-waste management issues for proper management of E-waste among others.
- ❖ The Department of Environment prepared draft solid waste management rules which is now in consultation stage and still time to include E-waste management issues in that rule.
- ❖ Bangladesh is a signatory to Basel convention prohibiting trans-boundary movement to hazardous waste.
- ❖ Import of any kind of waste requires Government permission.
- ❖ The High Court of Bangladesh has directed the Department of Environment to ensure that all ship- breaking yards operating without environmental clearance shut down their operations. The court gave ruling in March'90.
- ❖ The High Court also directed the government to ensure that no ship with hazardous wastes enter the country without being pre-cleaned at source or outside the territory of Bangladesh.
- ❖ The court observed that none of ministries had co-operated to ensure conformity to the environmental laws. The order said the government had to ensure that ships were only broken after guaranteeing safe working conditions for the laborers and having in place appropriate disposal arrangement for hazardous wastes and protection of environment.

### 8. Conclusion and Recommendation:

Till now no effective steps have been taken to stop generating e-waste or strict disposal of this sludge. Following actions can be taken as part of way forward:

1. Inventory of E-waste in large cities of Bangladesh.
2. Develop E-waste policy and guideline with consultation with the relevant stakeholders.
3. Establish efficient collection system at least for selected electronic waste.
4. Registration and capacity development of E-waste recyclers.
5. Introduction of Environmental Management System in E-waste sector.
6. Establish E-waste tracking mechanism in order to update the inventory.
7. Awareness raising and development of communication material (poster, leaflets, brochure, TV spot).
8. Monitor e-waste trafficking and shipment

### 9. Acknowledgements

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## Study Report; E-waste: Bangladesh Situation

### Field survey findings data tables:

#### Annex-A

##### CFL BULB:

Name of the companies	Yearly production/ per unit (2009-2010, up to June)	Yearly generated e-waste/ per unit (2009-2010, up to June)
Transcom	3200,000	31,58,400 (98.7%)
Energy pac	1600,000	15,83,840 (98.99%)
Other companies(Osaka, Onik, Delta, SKS, Rangs)	960,000	956,160(99.6%)
<b>Total</b>	<b>57,60,000</b>	<b>= 56,98,400</b>

Name of the companies	Last five year production/ per unit	Last five years generated e-waste/ per unit
Transcom	5253,313	52,00,254.538 (98.99%)
Energy pac	2626,657	26,16,150.372 (99.6%)
Other companies(Osaka, Onik, Delta, SKS, Rangs)	1575,994	15,59,446.063 (98.95%)
<b>Total</b>	<b>94,55,964</b>	<b>93,75,850.973</b>

##### Mercury /tub bulb:

Category	Number	No. of used mercury bulb up to 2010 June	No of generated / per unit e-waste up to 2010 June
Household	2,6785,715	8,0357,145	78476787.807(97.66%)
Industrial sector		4,0178,572	38925,000.553(96.88)
<b>Total</b>		<b>4,82142,866</b>	<b>11,74,01,788.36</b>

*Note: All figures indicate single unit*

##### Thermometer:

year	Urban household/ per unit	Used thermometer (ten years)/ per unit	E- waste(ten years)/ per unit
1971	3,3615,120	3,3615,120	3,3615,120
1971-81	8,0920,800	8,0920,800	8,0920,800
1981-91	10,0309,667	10,0309,667	10,0309,667
1991-2001	16,6254,182	16,6254,182	16,6254,182
2001-2010	22,9195,469	22,9195,469	22,9195,469
<b>Total</b>		<b>61,02,95,238</b>	<b>61,02,95,238</b>
<b>Within 39 years</b>	<b>(-3,36,15,120)</b>	<b>57,66,80,118</b>	<b>57,66,80,118</b>

*Note: All figures indicate single unit*

## Collective Samples of Questioners

## Annex-B

### Questionnaire for E- waste (In English) Television Set

Importer (companies):

1. Which brand television set do you import?
2. From where do you import?
3. How many sets do you import in a year?
4. What's the warranty of a television set?
5. How many sets are sold in a year?

Assembler:

1. From where do you collect the parts of a television set?
2. How do you assemble these parts?
3. Where do you assemble these parts?
4. What will the warranty of a TV set be?
5. Where do you dump the rejected parts?

Retailer:

1. Which brand television set do you sell?
2. How many sets do you sell in a year?
3. What's the warranty of a television set?
4. Which brand set is more sustainable in using?

Repairer:

1. Which brand television set do you repairer more?
2. How many set do you repair in a year?
3. Do you know what types of heavy metals are in a TV set?
4. Where do you dump the rejected parts/sets

### **Computer**

Importer:

1. Which brand computer set do you import?
2. From where do you import?
3. How many sets do you import in a year?
4. What's the warranty of a computer set?
5. How many sets/parts are sold in a year?

Retailer:

1. Which brand computer do you sell?
2. How many sets do you sell in a year?
3. Do you buy used computer?
4. How many used computer do you buy in a year?
5. What's the warranty of a computer set?
6. Which brand set is more sustainable in using?



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Assembler:

1. From where do you collect the parts of a computer set?
2. What will the warranty of a computer set be?
3. Where do you dump the rejected parts?

Repairer:

1. Which brand computer set do you repairer more?
2. How many set do you repair in a year?
3. Do you know what types of heavy metals are in a computer set?
4. Where do you dump the rejected parts/sets?

Institutions (Cyber café/ bank/office/Training centre):

1. Which brand is used in your organization?
2. How many years are you using these computers?
3. Are there computer here which have no warranty more?
4. Do you buy used computers for your organization?
5. From where do you buy used these sets?
6. How many used sets do you buy in a year?
7. Where do you dump the rejected parts of computer?

### Mobile phones

Companies:

1. Which brand mobile set do you import?
2. From where do you import?
3. How many sets do you import in a year?
4. What's the warranty of a mobile set?
5. How many sets are sold in a year?

Retailer:

1. Which brand mobile set do you sell?
2. How many sets do you sell in a year?
3. How many non brand sets do you buy in a year?
4. How many non brand sets do you sell in a year?
5. What's the warranty of a mobile set?
6. Which brand set is more sustainable in using?

Repairer:

1. Which brand mobile set do you repairer more?
2. How many set do you repair in a year?
3. Do you know what types of heavy metals are in mobile sets?
4. Where do you dump the rejected sets?

### CFL Bulb

#### Owner of the Company

1. CFL bulb stands for \_\_\_\_?
2. When have you started marketing of it?
3. What's the yearly production of CFL bulb in your company?
4. What's the total rate of selling of CFL bulb in a year ?
5. How many days does a CFL bulb sustain?
6. What's the consumption rate of it in a year in total Dhaka city?
7. What is your safety measure during production of CFL bulb?
8. From where do you import the raw materials of CFL one?
9. Where do you dump the waste of CFL bulbs?

#### Retailer

1. CFL bulb stands for-----?
2. When have you started marketing of it?
3. From which company do you buy CFL bulb?
4. How many bulbs do you buy in a year?
5. What's the total rate of selling of CFL bulb in a year?
6. How many days does a CFL bulb sustain?
7. What's the consumption rate of it in a year in total Dhaka city?
8. Where do you dump the waste of CFL bulbs?

#### Consumer

1. CFL bulb stands for-----?
2. Why do you use this bulb?
3. How many bulbs do you use in a year?
4. How many days does a CFL bulb sustain?
5. Do you know which elements are used to produce a CFL bulb?
6. Where do you dump the waste of CFL bulbs?
7. Do you know the impact of dumping of CFL bulb on environment?

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Survey in Bangla

### Questioner for E-waste (In Bangla) CFL Bulb

Annex-C

এনার্জি সেভিংস বাল্ব:

সময়: ১০মিনিট

উৎপাদনকারী:

১. CFL বাল্ব সম্পর্কে আপনার ধারণা কি?

ক. বিদ্যুৎ অপচয় রোধ করে

খ. দীর্ঘস্থায়ী

গ. ধারণা নাই

ঘ. অন্যান্য.....

২. কবে থেকে এ বাল্বের বাজারজাতকরণ শুরু করেন?

৩. আপনার কোম্পানি বছরে কতটা CFL বাল্ব উৎপাদন করে?

৪. এক বছরে কতটা CFL বাল্ব বিক্রি হয়?

৫. একটি CFL বাল্ব কতদিন টেকসই হয়?

ক. ৬ মাস

খ. ১ বছর

গ. ২ বছর

ঘ. অন্যান্য.....

৬. এক বছরে ঢাকা শহরে CFL বাল্বের মোট চাহিদা কত?

৭. CFL বাল্ব উৎপাদনের সময় কি নিরাপত্তা ব্যবস্থা গ্রহণ করেন?

ক. মাস্ক ব্যবহার করেন

খ. আবর্জনা ছড়িয়ে ছিটিয়ে রাখা হয় না

গ. অন্যান্য.....

৮. কোথায় থেকে ঈশখ বাল্ব তৈরির কাঁচামাল আমদানি করেন?

ক. ইসলামপুর

খ. জিজিরা

গ. মিরপুর ১১

ঘ. অন্যান্য.....

৯. উৎপাদনের সময় CFL বাল্বের আবর্জনাগুলো কোথায় ফেলেন?

ক. ডাস্টবিন

খ. গুদাম

গ. যত্রতত্র

ঘ. অন্যান্য.....

খুচরা বিক্রেতা:

সময়: ১০মিনিট

১. CFL বাল্ব সম্পর্কে আপনার ধারণা কি?

ক. বিদ্যুৎ অপচয় রোধ করে

খ. দীর্ঘস্থায়ী

গ. ধারণা নাই

ঘ. অন্যান্য.....

২. কবে থেকে এ বাল্বের বাজারজাতকরণ শুরু করেন?

৩. কোন কোম্পানি থেকে CFL বাল্ব ক্রয় করেন?

৪. হলে কতটা বাল্ব ক্রয় করেন?

৫. এক বছরে কতটা ঈশখ বাল্ব বিক্রি হয়?

৬. একটি CFL বাল্ব কতদিন টেকসই হয়?

ক. ৬ মাস

খ. ১ বছর

গ. ২ বছর

ঘ. অন্যান্য.....

৭. এক বছরে ঢাকা শহরে CFL বাল্বের মোট চাহিদা কত?

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ভোক্তা :

১. CFL বাস্ব সম্পর্কে আপনার ধারণা কি?  
ক.বিদ্যুৎ অপচয় রোধ করে খ. দীর্ঘস্থায়ী গ. ধারণা নাই ঘ.অন্যান্য.....
২. কেন এ ধরনের বাস্ব ব্যবহার করেন?  
ক.বিদ্যুৎ অপচয় রোধ করে খ.দীর্ঘস্থায়ী গ. খরচ কমায় ঘ.অন্যান্য.....
৩. বছরে কতটা ঝুঁকি বাস্ব ব্যবহার করেন?

৪. একটি CFL বাস্ব কতদিন টেকসই হয়?  
ক.৬ মাস খ.১ বছর গ.২ বছর ঘ.অন্যান্য....
৫. আপনি জানেন কি CFL বাস্ব কি কি উপাদানের সমন্বয়ে তৈরি?  
.....
৬. বাস্ব গুলো নষ্ট হলে কোথায় ফেলে দেন?  
ক. ডাস্টবিন খ.স্টোররুম গ.যত্রতত্র ঘ.অন্যান্য.....
৭. পরিবেশের ওপর CFL বাস্বের ক্ষতিকর দিক সম্পর্কে আপনি কি জানেন?  
.....

### Television

টেলিভিশন সেট:

সময়:১০ মিনিট

আমদানিকারক (কোম্পানি) :

১. কোন ব্র্যান্ডের টেলিভিশন সেট আপনি আমদানি করেন?  
ক) খ) গ) ঘ) অন্যান্য.....
২. কোথায় থেকে আমদানি করেন?  
ক. ভারত খ. তাইওয়ান গ. চীন ঘ.জাপান ঙ. মালয়েশিয়া
৩. এক বছরে কতগুলো সেট আমদানি করেন?
৪. সাধারণত কত বছরের জন্য একটি টেলিভিশন সেটের ওয়ারেন্টি দেওয়া হয়?  
ক. ২ থেকে ৫বছর খ. ৫ থেকে ১০ বছর গ) আরো বেশী
৫. এক বছরে কতগুলো সেট বিক্রয় করেন?

খুচরা বিক্রেতা:

সময়:১০ মিনিট

১. কোন ব্র্যান্ডের টিভিসেটে আপনি বিক্রয় করেন?  
ক) খ) গ)
২. এক বছরে কতগুলো সেট বিক্রয় করেন?  
.....

৩. একটি টিভিসেটের ওয়ারেন্টি কত বছরের হয়?  
৪. ক.২ থেকে ৫বছর খ. ৫ থেকে ১০ বছর গ) আরো বেশী

দেশীয় প্রস্তুতকারক:

সময়:১০

মিনিট

১. একটি টিভিসেটের বিভিন্ন যন্ত্রাংশ কোথায় থেকে সংগ্রহ করেন?  
.....
২. আপনি কিভাবে যন্ত্রাংশগুলোকে একত্রিত করেন?  
.....
৩. আপনি কোথায় এ কাজটি করেন?

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একটি টিভিসেটের ওয়ারেন্টি কত হয়ে থাকে সাধারণত?

ক. ২ থেকে ৫ বছর

খ. ৫ থেকে ১০ বছর

গ) অন্যান্য.....

৫. বাতিল যন্ত্রাংশগুলো কোথায় ফেলে দেন?

ক. ডাস্টবিন

খ. গুদাম

গ. যত্রতত্র

ঘ. অন্যান্য.....

মেরামতকারী: \_\_\_\_\_

সময়: ১০ মিনিট

১. কোন ব্র্যান্ডের টিভিসেট আপনি বেশি মেরামত করেন?

২. এক বছরে কতগুলো সেট মেরামত করেন?

৩. আপনি কি জানেন টিভিসেটগুলোতে কি কি ভারী পদার্থ থাকে?

৪. বাতিল সেটের অংশ/সেটগুলো কোথায় ফেলে দেন?

ক. ডাস্টবিন

খ. গুদাম

গ. যত্রতত্র

ঘ. অন্যান্য.....

### Computer

প্রতিষ্ঠান (সাইবার ক্যাফে/ ব্যাংক/ অফিস/ প্রশিক্ষণ কেন্দ্র):

সময়: ১০ মিনিট

১) কোন ব্র্যান্ডের কম্পিউটার সেট আপনার প্রতিষ্ঠানে ব্যবহার করেন?

২) কত বছর ধরে কম্পিউটার সেটগুলো ব্যবহার করছেন?

ক. ৩ থেকে ৫ বছর

খ. ৫ থেকে ১০ বছর

গ. অন্যান্য.....

৩) আপনার প্রতিষ্ঠানে ওয়ারেন্টি বিহীন কম্পিউটার আছে কি না?

ক. হ্যাঁ

খ. না

৪) আপনি কি ব্যবহৃত কম্পিউটার ক্রয় করেন?

ক. হ্যাঁ

খ. না

৫) কোথা থেকে ক্রয় করেন? (প্রযোজ্য হলে)

৬) এক বছরে কতগুলো ব্যবহৃত কম্পিউটার ক্রয় করেন?

৭) বাতিল সেটের অংশ/সেটগুলো কোথায় ফেলে দেন?

ক. ডাস্টবিন

খ. গুদাম

গ. যত্রতত্র

ঘ. অন্যান্য.....

আমদানিকারক(কোম্পানি) :

সময়: ১০

মিনিট

১. কোন ব্র্যান্ডের কম্পিউটারসেট/ যন্ত্রাংশ আমদানি করা হয়?

ক)

খ)

গ)

২. কোথায় থেকে আমদানি করেন?

ক. তাইওয়ান

খ. চীন

গ) অন্যান্য.....

৩. এক বছরে কতগুলো সেট আমদানি করেন?

৪. সাধারণত কত বছরের জন্য একটি কম্পিউটারসেট ওয়ারেন্টি দেওয়া হয়?

ক. ৩ থেকে ৫ বছর

খ. ৫ থেকে ১০ বছর

৫. এক বছরে কতগুলো সেট বিক্রয় করেন?



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২. এক বছরে কতগুলো সেট বিক্রয় করেন?  
.....
৩. আপনি বছরে কতটা নন ব্র্যান্ড মোবাইল সেট ক্রয় করেন?  
.....
৪. আপনি বছরে কতটা নন ব্র্যান্ড মোবাইল সেট বিক্রয় করেন?  
.....
৫. সাধারণত কত বছরের জন্য একটি মোবাইল ফোনের ওয়ারেন্টি দেওয়া হয়?  
ক. ১ বছর                      খ. ২ বছর                      গ. ৩ বছর                      ঘ. অন্যান্য....
৬. ব্যবহারের ক্ষেত্রে কোন ব্র্যান্ডের মোবাইল সেট অধিক টেকসই হয়?  
ক. নকিয়া                      খ. সনি এরিকসন                      গ. স্যামসাং                      ঘ. অন্যান্য.....

### Dental Equipments

#### পাইকারি বিক্রেতা:

১. কোন ধরনের মেডিকেল যন্ত্রপাতি আপনি আমদানি করেন?  
.....
২. কোন কোন দেশ থেকে আমদানি করেন?  
১. যুক্তরাষ্ট্র ২. জার্মানি ৩. জাপান ৪. অন্যান্য.....
৩. এক বছরে আমদানি হার কত?  
.....
৪. এক বছরে আপনি কত যন্ত্রপাতি সরবরাহ করেন?  
.....
৫. কোথায় কোথায় সরবরাহ করেন?  
ক. ক্লিনিক                      খ. হাসপাতাল                      গ. ডাক্তারের প্রাইভেট চেম্বার
৬. যন্ত্রাংশগুলো কত বছর ধরে ব্যবহার করা যাবে?  
ক. ২ থেকে ৫ বছর                      খ. ৫ থেকে ১০ বছর                      গ. অন্যান্য
৭. যন্ত্রাংশগুলোর গ্যারান্টি কত বছরের?  
ক. ২ থেকে ৫ বছর                      খ. ৫ থেকে ১০ বছর                      গ. অন্যান্য.....

#### ডাক্তার:

১. চিকিৎসা প্রদানের সময় আপনি কোন ব্র্যান্ডের যন্ত্রপাতি ব্যবহার করেন?  
.....
২. কত বছর ধরে যন্ত্রপাতিগুলো ব্যবহার করেন?  
ক. ২ থেকে ৫ বছর                      খ. ৫ থেকে ১০ বছর                      গ. অন্যান্য.....
৩. আপনি কি মেয়াদউত্তীর্ণ যন্ত্রপাতি ব্যবহার করেন?  
ক. হ্যাঁ                      খ. না
৪. বাতিল যন্ত্রপাতি কোথায় ফেলে দেন?  
ক. ডাস্টবিন                      খ. গুদাম                      গ. যত্রতত্র                      ঘ. অন্যান্য.....



### Medical Equipments

#### আমদানিকারক:

১. কোন ধরনের মেডিকেল যন্ত্রপাতি আপনি আমদানি করেন?

২. কোন কোন দেশ থেকে আমদানি করেন?

যুক্তরাষ্ট্র ২.জার্মানি ৩.জাপান ৪.অন্যান্য.....

৩. এক বছরে আমদানি হার কত?

৪. এক বছরে আপনি কত যন্ত্রপাতি সরবরাহ করেন?

৫. কোথায় কোথায় সরবরাহ করেন?

ক. ক্লিনিক খ. হাসপাতাল গ. ডাক্তারের প্রাইভেট চেম্বার

৬. যন্ত্রাংশগুলো কত বছর ধরে ব্যবহার করা যাবে?

ক.২ থেকে ৫বছর খ. ৫ থেকে ১০ বছর গ. অন্যান্য.....

৭. যন্ত্রাংশগুলোর গ্যারান্টি কত বছরের?

ক.২ থেকে ৫বছর খ. ৫ থেকে ১০ বছর গ. অন্যান্য.....

#### খুচরা বিক্রেতা:

১. কোন ধরনের মেডিকেল যন্ত্রপাতি আপনি ক্রয় করেন?

২. কোন ব্র্যান্ডের যন্ত্রপাতি আপনি ক্রয় করতে আপনি পছন্দ করেন?

৩. এক বছরে কত যন্ত্রাংশ ক্রয় করেন?

৪. এক বছরে আপনি কত যন্ত্রপাতি সরবরাহ করেন?

৫. কোথায় কোথায় সরবরাহ করেন?


ক. ক্লিনিক খ. হাসপাতাল গ. ডাক্তারের প্রাইভেট চেম্বার

৬. যন্ত্রাংশগুলোর গ্যারান্টি কত বছরের?

ক.২ থেকে ৫বছর খ. ৫ থেকে ১০ বছর গ. অন্যান্য.....

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ভাবুন পদক্ষেপ নিন



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