

7 Pollution

Corruption (including pollution) has become rife on land and sea in consequence of mankind's misdeeds. He has ordained it thus so that they may taste the fruit of their own works and mend their ways. (Qur'an 30:41)

What is pollution?

Pollution is harmful waste materials released into the natural environment.

Polluting materials can be solids, liquids or gases, and they can harm all parts of the environment, land, freshwater, sea and air – the soil we grow things in, the water we drink and where we fish, and the air we breathe. In the past, waste products were natural and would soon rot away or disperse, but modern man-made materials may last thousands of years in the environment, where they harm wildlife – and us.

Solid waste – Solid waste pollution is the most visible – and most of it is litter: rubbish from households and businesses that has been thrown out in the environment. Sewage (sludge) is also solid waste and an environmental pollutant if not properly treated.

Liquid waste, soil and water pollution – When liquids such as chemicals, oil and untreated sewage are released into the environment, they wash into the soil, into the groundwater and into the sea. In addition, rotting rubbish at rubbish dumps and ash from burnt rubbish contain toxic chemicals which dissolve when it rains. Many of these substances are poisonous to wildlife. Rotting organic material from rubbish and agricultural run-off contain nitrates which make the soil and water unsuitable for important natural communities, especially coral reefs and seagrass, because nitrates promote growth of algae which make the water cloudy and block light from the sea floor.

Air Pollution – Most air pollution comes from burning things. Smoke contains carbon dioxide – a greenhouse gas that contributes to climate change, and solid particles – soot. Vehicle exhausts contain harmful gases such as sulphur and nitrogen dioxides and toxic hydrocarbons. Burning plastic releases toxic gases into the air. Another source of air pollution is rotting rubbish which produces methane, another greenhouse gas, more damaging than carbon dioxide.

Bio-accumulation – When animals eat polluting materials (solids or liquids) that do not break down, they are not digested, but accumulate (build up) inside the animal. When that animal is eaten in turn, the pollutants accumulate. This builds up as you go up the food chain, so that the top predators – fish, birds, marine mammals, and humans – may be seriously affected.

How does pollution affect Zanzibar and Zanzibaris?

Solid waste – Most communities and businesses in Zanzibar have no formal solid waste collection, and our roadsides and communities are littered with plastic bags and bottles, metal cans, old clothes, batteries, tyres and diapers. This is very ugly; it repels tourists, who notice it immediately, and go home thinking we do not care about Zanzibar. It can also do serious damage to the environment. The damage is felt not only in the places where rubbish it is dumped, because it is blown about by wind, and washed away by rain into drains into the sea, then washes up on beaches, gets caught up on coral reefs or gets eaten by animals mistaking it for food.

Plastic: Plastic takes thousands of years to break down and is damaging whether on land or in the sea. Plastic litter gets eaten by cows, goats, and donkeys, bits of polystyrene and cigarette filters are eaten by birds and fish, and plastic bags are eaten by turtles which think they are jellyfish. The plastic blocks the animals' guts, and can kill them. Bags blow away and bottles get washed into drains and the sea. Plastic bags smother seagrass and can catch on coral and break it. Abandoned plastic fishing nets tangle on coral and continue to kill fish, turtles, and other marine life.

Rubber: Old car tyres collect water in which malarial mosquitoes breed. Burning tyres produces toxic fumes.

Glass: Glass can start fires in dry grass and broken glass can injure people and animals and damage vehicle tyres.

Metal: Metal litter such as cans or rusty nails can be dangerous, cutting children or animals. Metal takes a long time to break down and releases dangerous minerals into the environment, poisoning soil and water.

Wood: Wood is a natural material which does break down in time. However wooden products that have been painted or treated with **fungicide** or **insecticide** take a long time to rot, and the chemicals in them poison wildlife. Wooden things floating in the sea are also dangerous to boats. Wood comes from trees and so buying it leads to deforestation here and elsewhere.

Paper and card: Like wood, this will eventually break down, but until it does, it is ugly and can spread widely.

Appliances: All the materials from which **appliances** are made, such as batteries, glass and plastic, are potentially harmful to our environment. **Abandoned appliances** are also very ugly. Old fridges and freezers contain polluting gases, and children playing can get trapped inside them.

Batteries: Batteries contain poisonous chemicals such as mercury, lead and acids. Mobile phone batteries contain nickel and cadmium, which cause cancer. When batteries are put in **landfill** the pollutants are released slowly; if they are burned, they are released quickly in the smoke and ash from the fire. Heavy metals like mercury build up in shellfish, poisoning them – and these toxins are passed on to us when we eat the shellfish.

Sewage: Zanzibar has no sewage treatment to make sewage safe. In Stone Town and Marahubi, and other areas with sewers, the raw sewage washes straight into the sea. Where there are no sewers, people use **pit toilets**, but when they are emptied, the sewage is often dumped in wild places; otherwise, people have little choice but to go in the woods or on a beach. People also throw out dirty diapers on beaches all around Zanzibar. As well as it being unpleasant, it is also very dangerous. People walking, playing or collecting shellfish and farming seaweed on these beaches, or people who eat shellfish collected from them, are exposed to faecal matter that could make them very sick. Potentially deadly diseases such as cholera, typhoid, infectious hepatitis and infections caused by parasites can all be transmitted when we are exposed to untreated infected human waste. The germs also get into the groundwater and make our drinking water unsafe.

Animal dung: Animal dung smells bad and attracts **pests** such as flies. There are also some nasty parasites that can be caught from infected droppings.

Other solid organic waste: Organic waste such as meat, fish and vegetable waste does break down, but can still cause problems. When it is sent to **landfill**, it rots in big piles where there is no air (anaerobic) and the rotting process releases methane, a very bad greenhouse gas. If it rots in the open, it attracts **pests** such as rats, which carry disease, and Indian house crows, which kill hundreds of our native birds.

Liquid waste, soil and water pollution – Water is polluted by both households and industry. Rotting rubbish at rubbish dumps and ash from burnt rubbish contain toxic chemicals which dissolve when it rains. Household cleaning materials, the chemicals used in industrial processes, and **pesticides** used on farms, all wash into the soil, affecting plant growth, into the groundwater, polluting our drinking water, and into the sea, where they build up in organisms and cause health problems to animals and to people who eat them.

Oil: There are many types of oil and they are a special problem. Oil is used in cooking and

Ulikua unajua...?

- Taka taka is a top 3 complaint by tourists.
- Turtles eat plastic bags thinking they are jellyfish.
- Cigarette ends take more than 65 years to rot.
- A recent typhoid outbreak was caused by people helping themselves on the beach.
- recycling drinks and food cans uses 5% of the energy of making new ones.
- Two bird species that lived only on Pemba but nowhere else have probably become **extinct** because of crows that have invaded the island by eating rubbish.

thrown away. Other kinds of oil are **spilled** in people's homes and car mechanics' yards. If it is poured into drains, it gets into the groundwater and eventually to the sea, poisoning wildlife including the fish and shellfish that we eat. Engine oil, petrol and diesel are released from **outboard motors** and from ships flushing their fuel tanks. It smothers seagrass, coral, and seaweed being farmed. Seabirds get covered in it, and turtles and marine mammals can't breathe. If slicks wash up on beaches, shellfish are poisoned too, and the beach cannot be used any more by tourists or locals – it is very difficult and expensive to clean up. Oil **spills** from ships are rare but produce a lot of pollution when they happen.

Air pollution – Without proper rubbish collection, many people burn their household or business rubbish and most of us cook with wood or charcoal. It is not healthy to inhale smoke of any kind – it can cause lung disease and even cancer – but especially risky are fumes from burning plastic, rubber or batteries, and vehicle exhaust gases. Bad smells, especially sewage smells and burning rubbish, are horrible to live with and put off tourists.

What's wrong with the current solutions?

Dumping at sea – While the effects of dumping rubbish in the ocean are difficult to see, it has terrible impacts on marine life, which means also on the marine resources we depend on ourselves. It is also often a waste of time, because much of it washes back up on beaches during the next big **storm**. Untreated sewage carries disease and contaminates beaches and seafood.

Burning – Some waste products can be burnt safely, however burning plastic, **appliances**, rubber or batteries produces toxic smoke and ash. Open fires are also responsible for many fires that destroy homes and businesses, and kill people. The carbon dioxide produced is also a greenhouse gas.

Tembea ujione!

- Jumbi dump
- Any street or beach
- Maruhubi
- Wesha and Mtoni
- Micheweni
- Malindi fish landing site
- Green house plastic recycling centre

Landfill – Rubbish collected in Stone Town is taken to municipal and community dumps such as Jumbi on Unguja, but there is not yet any municipal rubbish collection in the rest of Zanzibar. Harmful germs and chemicals from rubbish (including hospital waste) drain into the groundwater. The dumps are not covered so they attract rats and crows, and plastic blows away. There is no air in the rotting process because of the huge volume of waste piled up, so they release methane, which is four times more harmful a greenhouse gas than carbon dioxide. **Landfill** sites eventually fill up – so to make space for more rubbish they are burned which is very dangerous and unpleasant for local communities that have to breathe in the noxious and smelly smoke.

How can we clean up Zanzibar?

Pollution is damaging our health, destroying natural resources that we need, and damaging industries we depend on such as fisheries and tourism. So what can we do to change this?

Reduce – We need to reduce the amount of waste we produce. If we don't create it, then we won't have a waste problem to solve. Put simply, we should buy less. Ask yourself 'Do I really need this?' when you shop. Choose products that use less packaging, because all packaging turns into waste.

Reuse – Use products that you need as many times as you can. If something is broken, get it **mended** instead of buying a new one. Give away or sell things you no longer need. Hold a community '**yard sale**': everyone brings old toys, clothes, furniture and other things they don't need any more, and neighbours can buy from and exchange with each other. You can save money too!

Recycle – With a little imagination, much of the rubbish littering our streets and beaches can be given a new life. This can be small-scale, when local people make beautiful crafts to sell to tourists. Many materials can now be recycled on an industrial scale here, including plastic and glass and collection centres for recyclable materials are being established in communities around Zanzibar. First, the materials are sorted by what they are made of. Then each kind of material is **chopped** up by a machine. The crushed material is exported overseas where it is used again to make new products. Ask your local recycling centre what materials they collect.

Until Zanzibar has universal recycling, there will be times you can't reduce, reuse, or recycle: in that case, what should you do?



Compost heap at Chumbe Island Coral Park – 80% of household waste produced in Zanzibar could be used to make compost © Nell Hamilton

droppings safely. Dog, cat and human faeces will rot too, but they can spread diseases, so do not put them on **compost heaps**.

Bonfire – While burning some things is bad, natural materials such as wood, plant, bones, food waste or animal droppings can be burnt. If you do burn waste, do it safely. Keep the fire small, never leave it unattended, choose a site a safe distance away from houses and trees or where the wind could blow smoke or sparks towards them, and don't make fires in extremely dry or windy weather. Never burn batteries, rubber, aerosols or plastic, as the smoke and ash they produce is toxic.

Landfill – Sometimes, as a last resort, we have to send things to **landfill**. But if you do, make sure waste is well packed in bags so it can't blow away, and that potentially dangerous substances such as engine oil or soiled diapers are safely contained. Dumps keep all the rubbish in one place, and in theory, the rubbish could be used for electricity generation in the future.

Compost – Waste made from natural materials that rot away, like food leftovers, garden waste, and even non-glossy paper, can be made into **compost**. **Compost** is a great soil improver which provides nutrients for growing plants and helps hold water. You can **compost** cooked food, but it should be buried deep inside the heap to avoid attracting **pests** like rats and crows. You can even **compost** cow, goat and donkey

Kitunze Kidumu!

- Don't drop litter!
- Say no to plastic bags – take a basket or cloth bag shopping.
- Refill and reuse water bottles.
- Use cloth nappies that can be washed and used again, instead of plastic diapers that have to be thrown away.
- Get involved in community and beach clean-ups.
- Have vehicles serviced regularly to make sure they are burning fuel efficiently, not producing lots of harmful black smoke.
- Lobby government to improve waste collection and recycling.
- Reduce, reuse, recycle! The following table tells you the best thing to do with your household waste, acceptable alternatives, what you can do as a last resort if there is no alternative, and what you should never do because it is dangerous to your health!

| What to do with waste | Reduce | Reuse | Recycle | Compost | Animal feed | Burn | Landfill | Dump at sea |
|--|---------------|--------------|---------------|-------------|-------------|------|----------|-------------|
| | ✓ Best choice | ✓ Acceptable | ✗ Last resort | ✗ Dangerous | | | | |
| Plastic | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Rubber | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Glass | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Metal | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Wood | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ |
| Paper / card | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ |
| Old clothes | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Appliances | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Batteries | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Plant waste | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| Meat / fish waste | ✓ | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ | ✓ |
| Animal dung | ✗ | ✗ | ✗ | ✓ | ✗ | ✓ | ✓ | ✗ |
| Diapers (pampers) and sanitary pads | ✓ | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ |
| Oil and petrol | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |