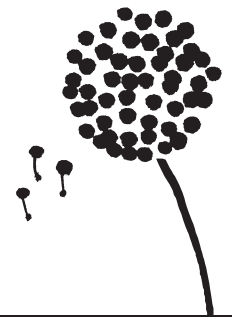


Footsteps

No.59 JUNE 2004

POLLUTION



TEARFUND

Reduce, reuse, recycle

We all produce rubbish. Usually we don't think about it. We just throw it away. But the world is running out of room to store all the rubbish that is piling up. If left lying around, rubbish becomes a health hazard and looks ugly. Burning rubbish pollutes the air and the ashes are often toxic. Sometimes rubbish is dumped into rivers and lakes and pollutes the water. Often rubbish is buried in the ground. Buried rubbish may contain toxic substances that leak into the soil and pollute the water supply.

There are three things we can do to limit the impact of rubbish on the environment – reduce, reuse and recycle.

Reduce

The best solution is to reduce the rubbish we make in the first place. For example, we should only buy products that do not have much packaging and that we really need.

Think carefully about what kinds of materials are used in the things we buy. Once they become rubbish, they might take a long time to decay.

Plastics There are nearly 50 kinds of plastics commonly used to make everything from juice containers and rubbish bags to windows and doors. Many plastics are strong and durable. They won't rot, decay or dissolve. However, making plastic uses a lot of energy. Many plastic products cannot be used again, so we throw them out. The problem with plastic rubbish is that it turns into poisonous products. For example, vinyl, which is used to make bottles, car parts and pens, pollutes the soil if it is buried and releases poisonous substances into the air if it is burned. We should try to reduce the amount of plastics that we use. However, some



Photo: Jim Loring, Tearfund

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- Household rubbish pits

Footsteps

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Footsteps is a quarterly paper, linking health and development workers worldwide. Tearfund, publisher of *Footsteps*, hopes that it will provide the stimulus of new ideas and enthusiasm. It is a way of encouraging Christians of all nations as they work together towards creating wholeness in our communities.

Footsteps is free of charge to individuals working to promote health and development. It is available in English, French, Portuguese and Spanish. Donations are welcomed.

Readers are invited to contribute views, articles, letters and photos.

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plastics can be recycled to make hair combs, floor tiles and polyester clothing.

Reuse

People are often very imaginative in reusing items, rather than throwing them away. For example, we can flatten empty aluminium cans and use them as sheet metal. We can make furniture out of scrap wood and use well-washed glass jars to store foods, carpentry and office supplies. More examples are given on pages 8–9 in this issue of *Footsteps*.

Recycle

If items such as glass bottles, metal and tin cans, newspapers and plastics cannot be reused, it may be possible for them to be recycled. For example, glass is washed in special factories, broken into pieces and then melted down into 'new' glass ready to be made into something else. Some countries have factories that will recycle these materials.

Hazardous waste

Some kinds of rubbish are more dangerous than others. Dangerous rubbish is called *hazardous waste*. This includes chemical rubbish such as batteries, floor cleaning liquid and insecticides. Medical



Photo: Isabel Carter

We can reuse materials for packaging or use natural products.

waste, such as needles, syringes, old medicines and soiled bandages can also be very dangerous. Hazardous waste can seriously damage the environment and our health.

Toxic waste Some hazardous waste is poisonous. If touched, this kind of waste can get into the body and cause cancer or other diseases. It can seriously harm unborn babies. It can also get into



How long does it take for rubbish to decay?

Newspaper	a few weeks	
Leather shoes	up to 50 years	
Cardboard boxes	several months	
Thin plastic	up to 5 years	
Banana leaves	a few weeks	
Tyres	unknown	
Plastic bags	10–20 years or even hundreds of years, depending on the type of plastic	
Scrap metals	up to 50 years	
Aluminium cans	up to 80 years	
Plastic bottles	hundreds of years	
Glass fragments	thousands of years	

the air, water and soil, and kill fish and animals. Poisonous waste comes from such things as cleaning products, rat poison and pesticides. This type of waste usually has a picture of a skull on the container.

Corrosive waste Some hazardous waste dissolves almost anything it touches, even human flesh.



Corrosive waste comes from such things as batteries, drain and oven cleaners, and ammonia-based cleaners. It usually has a picture of a skeleton hand on the container.

Flammable waste Some hazardous waste can catch fire and release toxic fumes into the air.



Examples are gasoline, oils and paint cleaners. Flammable waste usually has a picture of fire on the container.

Explosive waste Some hazardous waste can blow up when it is mixed with other chemicals or if it is dropped on the ground. Explosive chemicals are found in spray cans, gasoline and lighter fluid. Explosive waste usually has a picture of a bursting ball on the container.



If a container has any of these pictures on it, handle it very carefully. It once contained dangerous material and might still have some waste in it. Never burn these containers because the heat will release poisonous gases and smoke into the air. Be aware that often containers have no warning signs on them.

Governments around the world are slowly forcing industries to make waste less hazardous. In the meantime, we can do our part to handle hazardous waste properly. Never pour toxic liquid, such as used motor oil, paint and pesticides into rivers or lakes or down the sink. Store them separately and find the nearest site that will take them and get rid of them safely. This is very important for our health and for the health of the environment.

Adapted from Developing Countries Farm Radio network – Package 43, Script 4, Jan 1997 and Package 50, Script 10, Nov 1998



Photo: Mike Webb, Tearfund

Rubbish can spread disease and pollute the water supply.

EDITORIAL

Pollution is a problem in all countries, but the source of the problem may lie elsewhere. As consumption increases, pollution usually increases. *The State of the World 2004* report by the Worldwatch Institute contains some alarming statistics. The 12% of the world's population living in North America and Western Europe account for 60% of the world's consumption, while the 33% living in South Asia and sub-Saharan Africa account for only 3%.

These consumption patterns have a great impact on the environment. For example, pollution from transport, industry, energy production and large waste sites affects the world's climate. This contributes to global warming and increases the risk of floods and droughts. Industry and logging in the South – which are often producing exports for the North – may do great damage to the environment.

This issue of *Footsteps* challenges us to think about what can be done to reduce the effects of pollution. Advocacy work can be really important. The article about La Moya ecological reserve looks at how action by a few committed people helped to clean up the local area. We look at what is being done by governments to reduce the use of plastic bags in various countries. Other articles focus on reducing the amount of rubbish we produce. The centre pages look at creative ways that rubbish can be used again. There is an article about how an NGO in Bangladesh set up a project to turn organic waste into compost. We also look at less obvious types of pollution, such as smoke pollution within some Kenyan homes.

The Bible study helps us to think about what our attitude towards God's earth should be, and challenges us to take environmental issues seriously.

I have really enjoyed taking over the editing of this issue.

Future issues will look at facilitation skills and the impact of HIV and AIDS on children.

Rachel

Rachel Blackman, Sub Editor



La Moya ecological reserve

by Loida Carriel and Graham Gordon

Ayaviri is a town of 17,000 people, situated in the Andes mountains in Peru. It surrounds an ecological reserve called La Moya, which is the only place in the district that remains green throughout the year. La Moya has important historical and cultural significance. Two indigenous communities (traditional inhabitants) live on the edge of La Moya, and share it with Ayaviri. The communities keep animals in surrounding fields and during the dry season they depend on La Moya for food. However, La Moya has started to become polluted and is in danger of disappearing.

Action to save La Moya

In 1999, Pastor Eron of The Instituto Bíblico de Ayaviri (Bible Institute of Ayaviri) started raising awareness about the need to protect the reserve. Being able to speak Quechua, he met with the leader of one indigenous community and persuaded him of the need to keep the reserve clean. However, the

community leadership changes each year. This showed the need for awareness-raising to be done at all levels of the community.

The other indigenous community at first accused Pastor Eron of wanting to challenge their traditions and drive them from their traditional lands. They also saw little reason to co-operate as most of



Photo: Graham Gordon

Women washing clothes in the La Moya reserve.

the pollution and contamination came from the town of Ayaviri.

Action to save La Moya included:

- 'cleaning days', when the local institutions, such as the town council, university, museum and schools, together with people from the town and the communities, got together and cleared rubbish from the reserve
- removing rubbish from the reserve's lake
- distributing leaflets urging people to protect their local environment
- broadcasting regular environmental education programmes on the local radio.

Networks for change

The Bible Institute decided to develop a network of organisations to support the work. Tearfund partner Paz y Esperanza (Peace and Hope) helped them to produce awareness-raising materials and to think through their plans for change. They worked with the museum which helped with scientific research into the causes and effects of the damage to La Moya. Together they wrote about the history of the area to show the historical and cultural importance of the reserve.

A special group, called Mesa de Concertación (Round Table), was established to facilitate discussions between the local organisations and communities. It also helps to plan the development of the area. Many local institutions and groups are part of this process.

Pollution in La Moya

Reasons for pollution

- People from the town dump their rubbish in La Moya reserve. This practice has been going on for centuries but now it is much worse due to the increase in population and manufactured goods. This practice is particularly bad during Christmas festivals. In some places rubbish is one metre deep.
- Running water is available for only a few hours each day in Ayaviri, so people go to the river to wash their clothes. Studies have shown that each day 10–15kg of detergent flows down the river into La Moya.
- Because La Moya is the only green place in the area, people often go there for sports. This is starting to destroy the ecosystem on the drier parts of the reserve, which are turning to dust.
- Ayaviri is on a slope, so all the dirty water and rubbish from the town flows into the reserve. There is no drainage system to prevent this happening.
- Animals that use La Moya in the dry season cause contamination by their excrement.

Consequences of pollution

- The presence of rubbish means that La Moya is losing its beauty.
- Pollution leads to a shrinking in the size of the ecological system, which could disappear if the pollution continues.
- If La Moya becomes too small or disappears, the livelihoods of the two indigenous communities will be under threat.

There has been opposition to this work. For example, the candidates involved in the election for the mayor during 2002 accused those involved in the La Moya campaign of using it as a way to gain political power.

Results of the campaign

In December 2001, the mayor passed a law to prevent dumping of rubbish in La Moya reserve. He said that the Christmas celebrations, which are responsible for much of the rubbish, needed to take place elsewhere.

In November 2002 the mayor passed a law giving powers to an 'ecological patrol'. This patrol will guard the reserve and fine people for dropping litter or urinating in La Moya.

La Moya is much cleaner now as a result of the cleaning days and a change in behaviour. The level of awareness in the communities and the town is much higher, and they see the protection of La Moya as an issue that they need to help solve.

Future issues to address

The action taken so far will not provide long-term solutions as it has not addressed the root causes of the damage. The campaign is now addressing these issues. There is a need to:

- provide more running water to houses so that people do not need to wash their clothes in the river
- supply drinking water to the indigenous communities and Ayaviri



Pastor Eron (third from right) with members of one indigenous community, whose livelihoods are being badly affected by pollution in La Moya.

Photo: Graham Gordon

- provide alternative places to put rubbish
- find a way to stop infected and polluted water running into La Moya
- offer an alternative area for sports
- ensure that the laws passed are enforced by each new mayor and town council
- build the capacity of the local communities to advocate for change. The new mayor has developed a proposal to turn La Moya into a tourist reserve, without consulting the local people or the Mesa de Concertación.

Another problem is that the two indigenous communities have had little participation in any discussions about

the future of the area. They are still suspicious of the local authorities and fear that their land will be taken away.

As a result of this and other problems, the Bible Institute plans to:

- work with the Mesa de Concertación to ensure that it includes the indigenous communities and the poorest people in Ayaviri in the consultation and planning process
- continue to build relationships with the indigenous communities and help them to understand the causes of their poverty better. Then they can develop their own plans for La Moya and their future
- continue to raise awareness of the need to protect the environment
- strengthen contacts with organisations who can help get funding and can help with educational materials and activities that will build the capacity of the communities to take part
- mobilise members of the church to become more involved. In June 2003 Pastor Eron formed a working group which includes members from his church and members from the local community.

The authors work in Peru for Tearfund partner Paz y Esperanza (Peace and Hope).

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Communities surround La Moya ecological reserve and graze their animals there.

Photo: Graham Gordon



Increasing chicken production

We have developed these useful ideas for increasing production of our local poultry. We would like to share them with others.

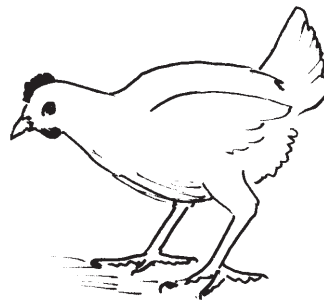
- Have about 20 free-range hens laying eggs, with one or two cockerels.
- Every day, collect and store their eggs in a cool, dark place.
- Once the hens have laid enough eggs they will want to start sitting. Allow each one to sit on just one egg marked with an 'X' in pen.
- When all the hens are ready to sit, place them somewhere where other

hens cannot disturb them and where they cannot go outside. Provide plenty of food, fresh water and soft bedding (grass, wood shavings, old clothing).

- Dispose of each egg marked with an 'X' and replace with 10–15 fresh eggs (depending on the size of the hen).
- After 21 days all the eggs should hatch out. Now you can leave the chicks with the mother hen and provide additional food for them. Alternatively you can remove the chicks from the hens and raise them in a safe house, keeping them warm and providing chick feed. This means that the hens will quickly start to lay again, but you will have to give special care to the chicks.

I would be very happy to hear from farmers about how they use these ideas.

Emmanuel Mabba
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 Funyula
 Busia
 Kenya



Making hats

I am presently looking for ways to use waste materials like empty drink cans, paper cartons, rags and cloth pieces from tailors which litter our environment. I am particularly interested in knowing about hat-making manuals or books which I can use to teach young school-leavers how to make attractive hats at low cost.

Amuche Ngwu
 c/o Dr EK Ngwu
 Department of Home Science and Nutrition
 University of Nigeria
 Nsukka
 Enugu State
 Nigeria

Oil education

I come from Timberi, a small village in southern Chad. In 2000 the government recognised southern Chad as an oil-rich region and signed many agreements with different organisations and oil companies to exploit the 'black gold'. The majority of people in Chad are not literate and cannot demand their rights, so the organisation Epozop (People together in the oil-rich area) was created. It works to claim fair compensation for our people because the oil pipeline passes through many villages, fields and clumps of trees, which are necessary for their survival. There are also risks to the environment, so Epozop is informing the people of the dangers and advantages linked to oil.

Peurtoloum Mbaidoum
 Timberi
 S/c Mme Geneviève Pillet
 ATNV, BP 35
 Moundou
 Chad

Papaya

I read about the use of papaya in pest control in *Footsteps 54*. This reminded me of other uses. Papaya leaves can be used instead of soap to remove stains from clothing. The milky juice or latex can be used in tanning hides. The chemical *papain*, which can be extracted commercially from the latex, has many uses.

Reflections on noise

Noise is one type of pollution which affects our quality of life, though we are not always aware of it. Sound is measured in decibels. Sounds above 85 decibels are considered dangerous to our ears. Here are some examples of sounds and their volume:

- | | | | |
|------------------|--------------------|------------------|--------------|
| • Countryside | 20 decibels | • Industry | 90 decibels |
| • Conversation | 60 decibels | • Motorbike | 93 decibels |
| • Moving traffic | 75 to 100 decibels | • Pain threshold | 120 decibels |

The difference between noise and sound is a very personal one. Sounds that people find annoying become noises, regardless of volume. The siren of an ambulance could be defined as a noise by some people, but not by those waiting for emergency attention, for whom it is a welcome sound.

Noise creates tension, anxiety and discomfort. It may harm the ear, disrupt sleep, stimulate the nervous system, affect memory, cause accidents and can affect our ability to think clearly.

Noise spreads. Laws are not used to tackle noise in the city because nobody is officially responsible for managing it. To bring in protective measures, we first have to start with an awareness campaign to encourage people to reduce noise, moderate their behaviour and understand that the street belongs to everyone.

Adapted from an article by Jorge Alberto Mastroizzi. Sent in by Adrian Gustavo Lapponi, Argentina

However, I am worried about what might be the short-term or long-term hazards from using papaya.

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EDITOR'S NOTE

The ripe papaya fruit is an excellent source of vitamins and minerals and can be safely enjoyed once the skin is removed. There are no health concerns about its use. The chemical papain, found in the leaves, seeds and particularly in the juice or latex collected from the bark or from unripe fruit, has many uses, both commercially and medicinally. However, it must be used with care as fresh, concentrated latex can irritate the skin. Always wash hands carefully after extracting or using it. Only use medicinally in the quantities recommended in *Footsteps* 48. In larger quantities it could cause skin problems, diarrhoea and severe stomach upsets. Treat with the same care as with any medicinal compounds.

Marketing moringa

Moringa is a 'miracle tree' that has been promoted in Uganda over the last five years. The response of the population that is struggling to move out of poverty has been overwhelming. Today, hundreds of farmers have more than two acres of moringa, but little hope to gain much from it. Can readers of *Footsteps* suggest any possible markets for the tree products? If there is any organisation, company or government that has experience in handling and marketing moringa, their advice will be gratefully received.

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Moringa leaves

Thank you for all the information over the years in *Footsteps* which we have received from the first issue and used as a library resource.

We found moringa trees grew extremely well in the very dry, sandy soil of Nebbi District, Uganda. We encouraged people to grow them and use the leaves as a

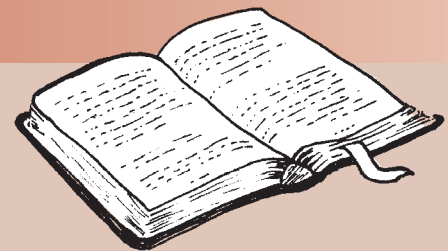


green vegetable. However, one day we found we had a lot of extra leaves remaining after cooking with a group. We showed people how quickly the leaves dried and how easily they could be powdered, using the information from *Footsteps* 46. Now it has become so popular that powdered moringa leaves are being sold in the markets in West Nile!

Anne O'Connell can be contacted in the UK at:
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BIBLE STUDY

Caring creatively for God's world by Bob Carling



The Bible says a lot about how we relate to the Earth on which we live. This has implications for our attitude towards it and how we care for it.

Read Genesis 1

The Earth and all that God has made is 'very good' (Genesis 1:31).

- How does this help us to see that spoiling the beauty of the Earth is wrong?

Read Psalm 24

- If we start to see the world as God's and not ours, how might we treat it differently?

Read Genesis 1:26-28 and 2:15

- What do these verses say about our relationship with the rest of creation?
- How might we reflect God's character by being creative in our care for the world?

Read Exodus 23:10-11 and Deuteronomy 20:19-20 and 22:6

God has set limits to our use of the natural world. We should no longer see it as something to pollute or waste.

It can be easy to fall into despair with all the problems of pollution and the lack of care for God's creation.

Read Psalm 8, Psalm 104 and Psalm 145

Think about God's goodness in creation, God's faithfulness to his people and God's provision for all needs.

- How do these things bring hope rather than despair?

Bob Carling is a freelance science editor working for a number of science publishers. He also runs a branch of a new media company, using new ways of communicating using computer and internet technology.

Creative ways of reusing materials

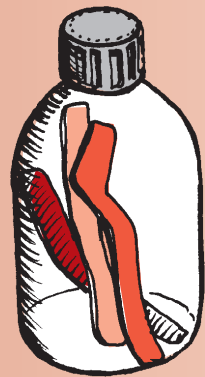
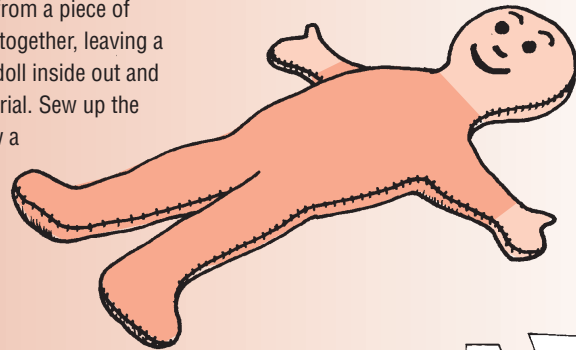
We often throw things away when they are no longer useful. However, there may be other purposes we could use them for. These pages contain some suggestions for using everyday items to make toys or household items. The materials should be cleaned thoroughly before they are used again.

Based on information from Sally Grantham-McGregor and Isabel Carter.

Making toys

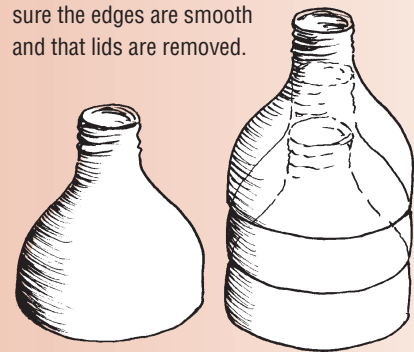
Doll

Cut out two doll shapes from a piece of cloth and sew the edges together, leaving a small opening. Turn the doll inside out and stuff with scraps of material. Sew up the opening and sew or draw a face on the doll.



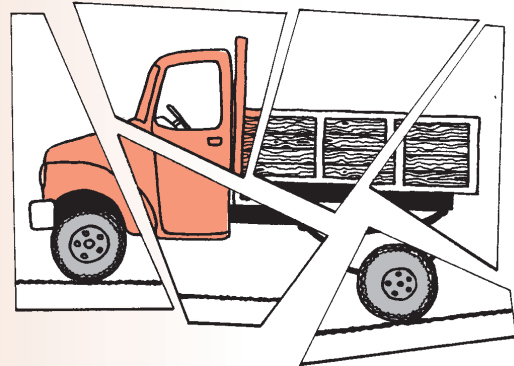
Rattle

Cut long strips from coloured plastic bottles. Put them inside a small clear plastic bottle and glue the lid on.



Stacking bottle tops

Cut at least three identical round plastic bottles in half for young children to make into towers. Make sure the edges are smooth and that lids are removed.



Puzzle

Draw or glue a picture on a piece of cardboard. Cut the picture into pieces. The older the child, the more pieces the picture can be cut into, to make the puzzle more difficult.

Household items

Newspaper bags

Fold pieces of newspaper and glue or tape them along the sides. Use a few sheets together for extra strength.

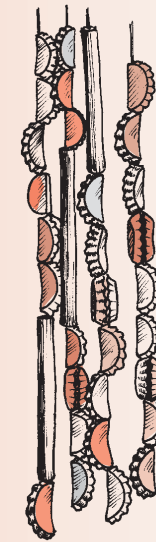
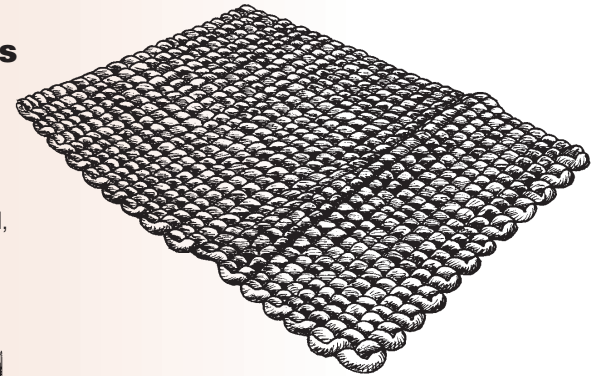


Plastic bottle packaging

Use the bottoms of two bottles, one to make the container and the other to make the lid. Make four vertical cuts around the lid and make them into petal shapes. Smooth down the rough edges and put the lid on.

Plastic bag mats

When plastic bags can no longer be used as bags because of holes, they can be knotted or woven into mats. If coloured plastic bags are used, patterned mats can be made.



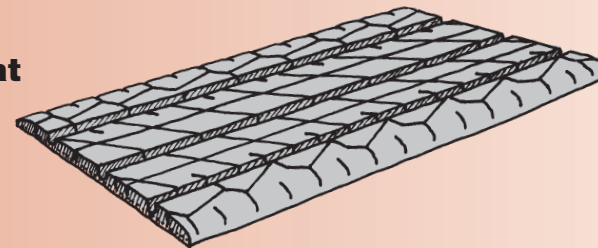
Soda bottle top curtain

Use a hammer to bend soda bottle tops in half. Thread these onto some long lengths of strong string. Attach them to a length of wood and hang the curtain. Beads and other materials can also be threaded onto the string between the bottle tops.

Uses for tyres

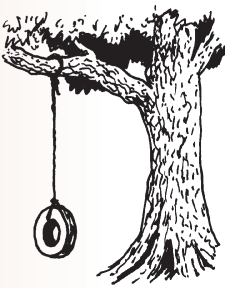
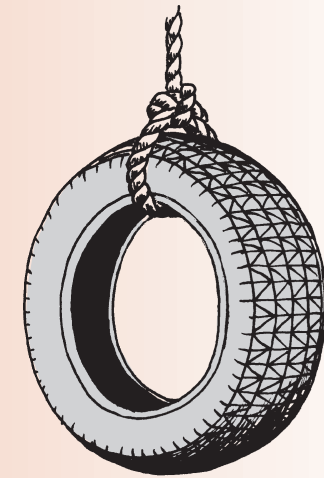
Doormat

Caution! Ensure there are no sharp wires sticking out from the edges.



Plant container

Lay some plastic bags under the tyre to prevent water draining away.



Swing

Tie a strong piece of rope around a tyre and hang it from a tree. Make a hole in the bottom of the tyre so that rainwater does not collect in it. Ensure that the knots are secure.

Household waste management in Dhaka, Bangladesh

by Iftekhar Enayetullah

Over six million people live in Dhaka and each day they produce over 3,000 tons of household waste. Yet the Dhaka City Corporation collects less than half of it. The rest remains on roadsides, in open drains and in low-lying areas. This has a negative impact on the city's environment. It is estimated that the population of Dhaka will be 19.5 million by 2015. It will become very difficult to find sites to bury the waste as the city expands, and transport costs to transfer the waste will increase. The volume of waste needs to be reduced to a sustainable level.

In Dhaka, scavengers known as *tokai* search for materials which can be reused or recycled. They sell them to enterprising local people who arrange for the materials to be sorted, cleaned and then sold to recycling factories. This informal system shows that waste has value.

Learning points

- Community mobilisation is a long-term, time-consuming process. It is important to raise public awareness about the programme in order for communities to join.
- Efforts should be made to develop new techniques, such as enriching the compost to cater for the needs of companies who buy the compost.
- Marketing of the compost was an important feature of this programme. The programme is only financially possible if a market exists. A lot of time and effort was invested in developing relationships with private companies to market the product.
- The programme required partnerships with the public sector, private sector and civil society organisations.

Community-based composting project

An organisation called Waste Concern started a community-based composting project in 1995 to promote the concept of the '4 Rs' – reduce, reuse, recycle and recover waste – in urban areas. It is based on the idea that the organic content of Dhaka's household waste, which accounts for more than 70% of total waste, can be efficiently converted into valuable compost. This reduces

disposal costs and prolongs the lifetime of landfill sites. It also reduces the harmful environmental impact of landfill sites, because organic waste is responsible for groundwater contamination and methane gas emissions. By turning the organic waste into compost, the soil in urban areas can be improved.

The project involved setting up a number of small-scale enterprises in different neighbourhoods. Activities include house-to-house waste collection, composting of the collected waste and marketing of the compost and recyclable materials. The project was so successful that in 1998 the government selected Waste Concern to extend the project to five other communities of Dhaka, supported by the United Nations Development Programme.

Waste Concern asked government agencies to provide land, water and electrical connections to establish the community-based composting plants. It also built up relationships with private companies to market the compost and recyclable materials. Waste Concern sets up community waste management committees and provides technical assistance and training to help them manage, operate and maintain the services. Members of the committees are mostly women. They are trained in collection, waste separation, composting and marketing. After a year of community mobilisation and training, Waste Concern hands over the project to the community but continues to monitor it for three years.



Collecting the waste.

Photo: Waste Concern



Photo: Waste Concern

Turning the waste in the composting plant.

Waste collection

Rickshaw vans are modified to collect waste from each house. Each van has a part-time driver and one or two waste collectors, and serves 300–400 households. Households pay on average 20–35 cents per month to have their waste collected. This covers the salary of the van drivers and waste collectors as well as operation and maintenance costs. Households report that the house-to-house waste collection service is convenient. Some said that previously they could not rent out their houses due to the large, overflowing waste bins in front of them. After a few months the communities get rid of all the bins.

Composting process

Once the waste has been collected, it is taken to a nearby composting plant. Organic waste is converted into compost using a method that does not produce bad smells. This is important because the composting plants are located near homes rather than industrial areas. The waste is sorted into organic waste, recyclable materials and rejects. The rejects are collected by the Dhaka City Corporation and taken to the landfill.

The organic waste is piled around a bamboo rack to allow a good circulation of air which speeds up the breakdown of the waste. Sawdust is mixed with the waste to increase the air content. The pile is turned frequently in order to maintain the temperature and to ensure equal

decomposition throughout the pile. Water is used to speed up decomposition. Chicken and cattle manure are added to increase the nitrogen in the compost.

This process takes 40 days. The pile is then left to mature without turning or watering for 15 days. The compost is then separated into fine and coarse grades and packed into 50kg bags to sell. Large lumps are recomposted.

One plant produces 500–600kg of compost each day by processing 2–3 tons of household waste. This involves six workers, mostly women.

Marketing

There is a good market for compost in Bangladesh. Waste Concern helps the communities sell their compost to a number of businesses, such as fertiliser companies and plant nurseries. Each 50kg bag of compost sells for US \$2.50–\$4.50. Waste Concern have been asked to install more community-based compost plants to meet the growing demand for enriched compost.

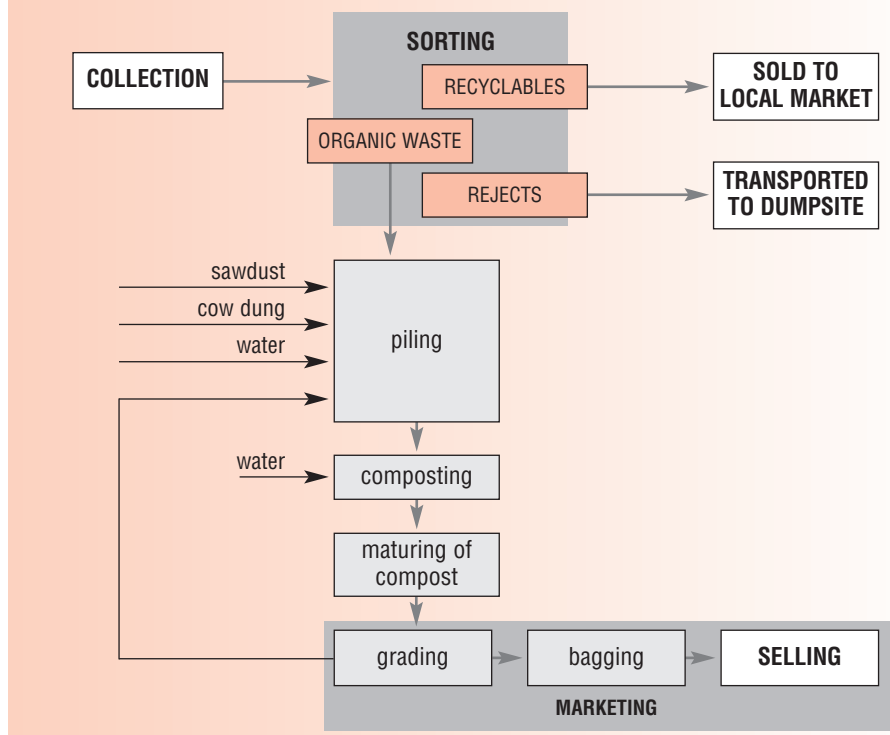
This programme has significantly cleaned up communities, created jobs for poor people, reduced the Dhaka City Corporation's waste management costs, and created business opportunities. Composting all organic waste in Dhaka would create new jobs for about 16,000 poor people, especially women. It has become a model which several city governments and NGOs are now trying to copy.

Iftekhar Enayetullah is the co-founder and director of Waste Concern.

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The household waste management process



Reducing indoor air pollution

PARTICIPATORY APPROACHES IN KENYA

by Elizabeth Bates, Nigel Bruce, Alison Doig and Stephen Gitonga

Around 80% of people in rural sub-Saharan Africa depend on fuels such as wood, dung and crop residues for their domestic energy. Smoke from burning these fuels inside homes can lead to an increase in serious health problems such as pneumonia and lung disease. This particularly affects women and young children who spend large amounts of time in the kitchen.

In Kenya, the Intermediate Technology Development Group (ITDG) carried out the Smoke and Health project, which worked together with 50 rural households in two communities to reduce air pollution in their homes.

Field staff informed women's groups of the project and what it hoped to achieve. There was no shortage of people wanting to take part in the project.

Baseline assessment

A baseline assessment was first carried out so that the impact of the project could be measured. A questionnaire was used by field workers with each household. It recorded information such as the size of the household, means of cooking and lighting, plan and structure of the house, time and activity spent in the kitchen, and health of the household.



Woman using a fuel-efficient stove in Kisumu.

The smoke pollution levels in kitchens were measured. In some kitchens, the level of particles in the air that cause damage to the lungs was 100 times greater than acceptable levels.

Focus group meetings

Participants identified the following problems associated with indoor pollution:

- painful, watering eyes
- chest infections
- ear infections
- breathlessness, chest pains and difficulty in breathing
- frequent headaches
- stained clothes.

The participants listed some benefits of smoke, such as drying firewood, repelling insects and preserving cereals.

The focus groups identified three key ways that the situation could be improved:

- improve air flow by increasing the size of windows or opening the eaves spaces (the gap between the roof and the walls)
- add smoke hoods over the cooking area
- install improved stoves.

In one community, husbands were involved in these discussions. This was important because they are usually responsible for house building.

Interventions

Group discussions and individual house visits were used to identify positions for windows, eaves spaces and smoke hoods. Models of hoods were made with paper and checked by local builders who



Woman cooking using a smoke hood.

were either experienced in local manufacturing techniques or had been trained as part of the project.

Once these improvements were in place, households were trained to use and maintain them well. This was done mainly through women's groups. For example, the importance of opening windows in order for them to be effective was stressed.

Outcomes

Increasing the size of the eaves spaces successfully reduced smoke in one community. However, due to the different house design in the other community, eaves spaces could not be used.

The use of windows was less effective in reducing smoke levels in the home, but opening the window improves the way

fires burn. Windows have had other benefits which have improved the quality of life.

Households that used improved stoves experienced little improvement in pollution levels, but they have benefited from reduced fuel use, shorter cooking time, increased safety and ease of use.

Community members said that, as a result of the improvements, the reduction of smoke was much higher than they had expected. It was found that the introduction of hoods reduced the number of dangerous particles in the air by 75%.

Some problems were found. These include:

TECHNICAL PROBLEMS For example, windows made kitchens cold and draughty and wick lamps were blown

Improved health

Refa's husband used to suffer from asthma attacks and so never went into the kitchen. After the project, he is willing to help Refa with domestic jobs. He now wakes up at 5.30am and puts his bathing water on the fire. When he goes to bathe he leaves the tea on the fire. Refa does not have to wake up as early as she used to or do all the household chores by herself.



out on very windy days. Cats and dust came in through the window. Mesh could be used to prevent cats.

SOCIAL FACTORS Some people were worried that thugs and thieves could see into their houses. Shutters were helpful. Chimney hoods made it more difficult to lean over the pot to cook.

ECONOMIC ISSUES The cost of smoke hoods is higher than most households can afford. They can be made more affordable by using scrap metal instead of new metal, and making some parts of the hood from clay and other materials.

The project has had a positive impact on the lives of local builders who have been trained by the project. They benefit from orders for smoke hoods. Neighbours of the women involved in the project feel that a bigger group needs to be targeted to meet the demands of the community.

ITDG is now working on similar projects with communities in urban Kenya, in a high cold region in Nepal and with displaced people in Sudan.

Elizabeth Bates and Alison Doig both work for ITDG UK, Stephen Gitonga works for ITDG Kenya, and Nigel Bruce works in the Department of Public Health at the University of Liverpool, UK.

*For further details about the project:
E-mail: lizb@itdg.org.uk*

*ITDG, Bourton Hall,
Bourton-on-Dunsmore, Rugby
CV23 9QZ
UK*

Benefits of smoke reduction

Improved health

- better sleep due to reduced heat
- fewer headaches, coughs and chest pains
- reduction in aching eyes, tears and running nose
- improved safety because smoke hoods stop children and goats falling onto the fire
- snakes and rodents find it more difficult to hide in houses with windows
- food free from soot contamination

Reduced work

- less soot on walls, ceiling, hair, sheets, children's books and clothes
- easier to wash the children and do housework
- able to watch calves through the windows

Reduced expenditure

- daylight through windows reduces kerosene use for lighting
- food stays longer without spoiling

Improved environment

- improved lighting
- smell removal due to fresh air circulation

Increased opportunity for income-generation

- windows enable people to sew and do beadwork inside when the weather is bad
- reduction in time lost due to ill health
- improved children's grades at school because windows enable them to work indoors when the weather is bad

Empowerment

- women felt more confident through sharing knowledge with their neighbours
- they were more confident welcoming people into their homes



Photo: ITDG / Dr Nigel Bruce

Traditional Maasai house, but with chimney and window to reduce smoke in the house.

Action against plastic bags

Plastic bags are easily carried by the wind. They hang in bushes, float on rivers, flap from fences, clog drains, choke animals and affect the way the landscape looks. Few plastic bags are recycled and most types of plastic bags take hundreds of years to decay. In South Africa, plastic bags are so

common they are called the 'national flower'. In India, around 100 cows die each day from eating plastic bags that litter the streets.

Efforts have recently been made in some countries to reduce the use of plastic bags.

Ireland

ACTION TAKEN Shop customers must pay a tax of 15 cents per plastic bag.

OUTCOMES

- Estimated 90% reduction in use of plastic bags.
- Customers buy tough, reusable shopping bags or use free paper bags provided by shops.
- Money raised from tax is used for environmental projects.

Taiwan

ACTION TAKEN Free provision of plastic bags by shops banned.

PENALTY Up to US \$8,600 fine for shops.

OUTCOMES

- Plastics workers protested. The government agreed to help them find other jobs.
- The law does not yet apply to market traders and street vendors.

India

ACTION TAKEN Production, storage, use, sale and distribution of polythene bags banned in states such as Himachal Pradesh, Goa, Kerala and Maharashtra.

PENALTY In Himachal Pradesh, up to seven years in prison or US \$2,000 fine for anyone using a polythene bag.

OUTCOME Limited impact because the ban is not well enforced.

Discussion questions

- What problems are caused by plastic bags in our country?
- What actions could be taken to reduce the number of plastic bags produced and used?
- What would be the negative effects of such actions?
- Which type of action would be most useful and have the fewest drawbacks?
- How can we challenge our government to take action to reduce the use of plastic bags?

*Based on information from the BBC and UK Guardian newspaper websites, and Ravi Agarwal of Toxics Link, India
www.toxicslink.org*

Bangladesh

ACTION TAKEN Polythene bags banned.

PENALTY 10 years' imprisonment or a US \$17,000 fine for anyone making polythene bags and a US \$9 fine for anyone found using one.

OUTCOME Jute bags are now used more widely. This has encouraged the jute industry.

South Africa

ACTION TAKEN Use of thin plastic bags banned.

PENALTY Up to ten years in prison or US \$13,800 fine for shops using thin bags.

OUTCOMES

- Shop customers now pay for thicker bags, which are reused and easier to recycle.
- Reduced litter. However, there is concern that as only thin plastic bags have been banned, there will still be litter from thicker bags.
- Many factories have closed down because they cannot make the thicker bags, resulting in a loss of jobs.
- People who make things from plastic bags now have to buy the bags and therefore make less profit.



Photo: Isabel Carter

Books Newsletters Training materials

Fundraising

by Rachel Blackman

This is book six in the ROOTS series, produced by Tearfund. Fundraising is often done in a disorganised way, rather than in a planned, forward-looking and strategic way. This book shows how to develop a fundraising strategy and contains ideas to help organisations diversify their funding base. The book costs £10 (US \$18, €14.50), including postage, and is available from:

Tearfund Resources Development
PO Box 200
Bridgnorth
WV16 4WQ
UK

E-mail:
roots@tearfund.org



Ecovox

Ecovox is a magazine which contains articles and interviews on many aspects of the environment, relating particularly to Africa. It is published in French, three times a year, by Christian organisation CIPCRE in Cameroon and Benin. To find out about subscription costs, write to:

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E-mail: ecovox@wagne.net

Articles from back issues can be read on their website: www.wagne.net/ecovox

Environments and Livelihoods

by Koos Neefies

Is poverty to blame for the global environmental crisis or is environmental degradation a major cause of poverty? This question is at the heart of this book. It reflects on the relationships between

poverty and environmental change, discussing practical tools and approaches to project management. The book is intended to be used to support the campaigning and lobbying work of local and international development organisations, to improve the implementation of development strategies, and to strengthen participatory project planning, monitoring and impact assessment.

The book costs £12.50 and can be bought from local distributors who are able to accept payment in local currency. Contact details for local distributors can be viewed on the Oxfam website www.oxfam.org.uk,

or write to:

Oxfam Publishing
274 Banbury Road
Oxford
OX2 7DZ
UK

E-mail: publish@oxfam.org.uk

Advocacy Guide to Private Sector Involvement in Water Services

This guide has been written for community and civil society organisations and builds on the results of a two-year research project undertaken by Tearfund and WaterAid. The guide aims to help readers encourage governments to make water utility reform processes more poverty-focused.

The guide can be downloaded as a pdf file from: www.tilz.info/psp-water-guide

... or ordered from:

Public Policy Team Administrator
Tearfund
100 Church Road, Teddington
TW11 8QE
UK

E-mail: ppadministrator@tearfund.org



Living Positively

A community-based approach to combat HIV/AIDS

This pack has been produced by the Mothers' Union for use by experienced facilitators who work with groups. The aim of the pack is to raise awareness of HIV/AIDS and to help a group share ideas and suggestions and to plan action to address HIV/AIDS issues. The pack contains a number of booklets which look at:

- HIV/AIDS issues
- faith and HIV/AIDS
- personal stories
- raising awareness and campaigning
- participatory exercises
- pictures and role plays
- praying.

Copies are available free of charge from:

Mothers' Union
Mary Sumner House
24 Tufton Street
London
SW1P 3RB
UK

E-mail:
mu@themothersunion.org
Website: www.themothersunion.org



Smoke – the Silent Killer

Indoor air pollution in developing countries

by Hugh Warwick and Alison Doig

The pollution from the burning of traditional fuels for cooking and heating is linked to the deaths of over 1.6 million people each year. Despite this, very few people are aware of the risks of indoor air pollution. It is the silent killer. This book looks at the health impacts of smoke and presents technical solutions and strategies for reducing exposure to smoke in the home.

It costs £7.95 and is available from:

ITDG Publishing
103–105 Southampton Row
London
WC1B 4HL
UK

E-mail: orders@itpubs.org.uk
Website: www.itdgpublishing.org.uk

Household rubbish pits

A rubbish pit is a way of disposing of household waste by burying it, after it has been reduced or recycled as much as possible. This helps prevent contamination of water supplies and breeding of flies and rats which may spread disease to people in the community. A rubbish pit reduces unpleasant smells and removes household waste from sight.

Household rubbish should be sorted before it is considered for the rubbish pit. Organic materials, such as vegetable peelings, should be used to make compost. Other types of household rubbish could be reused or recycled. Avoid putting batteries and other toxic waste in a rubbish pit as these will contaminate the soil and water sources.

An average rubbish pit should be the size of two or three doors. This size of rubbish pit will last for about five years for an average family. For large households, the rubbish pit could be bigger.

Selecting a site

The following factors should be considered:

Distance The rubbish pit should be far enough from wells and streams to protect water sources from contamination. More than 30m is recommended. It should be far enough from houses to stop people falling in, but not so far that waste has to be carried a long way. Between 20m and 100m is recommended.

Geography The rubbish pit should not be located on valuable land, such as crop land. If the pit is dug on wet ground it may smell bad.



Using the rubbish pit

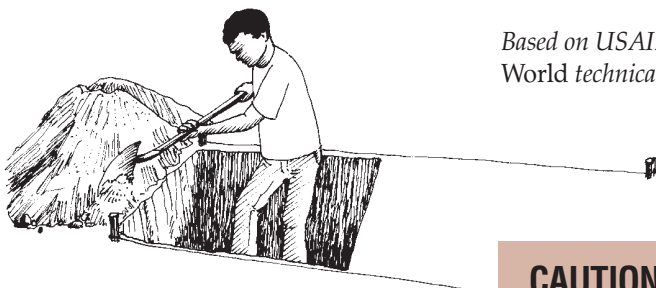
When rubbish is placed in the pit, cover it with a thin layer of soil. Do not leave exposed waste in the pit. Compact it and cover immediately.

When the waste and cover soil have nearly risen to the ground surface, place a final thick layer of soil or composted material. Then dig a new pit.

Based on USAID (1982) Water for the World technical notes: www.lifewater.org

Groundwater The bottom of the pit must be at least 1m above the level of groundwater during the rainy season. If necessary, dig a test hole 1m deeper than the bottom of the proposed pit just after the rainy season. If no groundwater is observed in the hole, the site is suitable.

Cover soil The pit should be located near ground which can be easily dug. Keep the soil that has been removed for covering the rubbish.

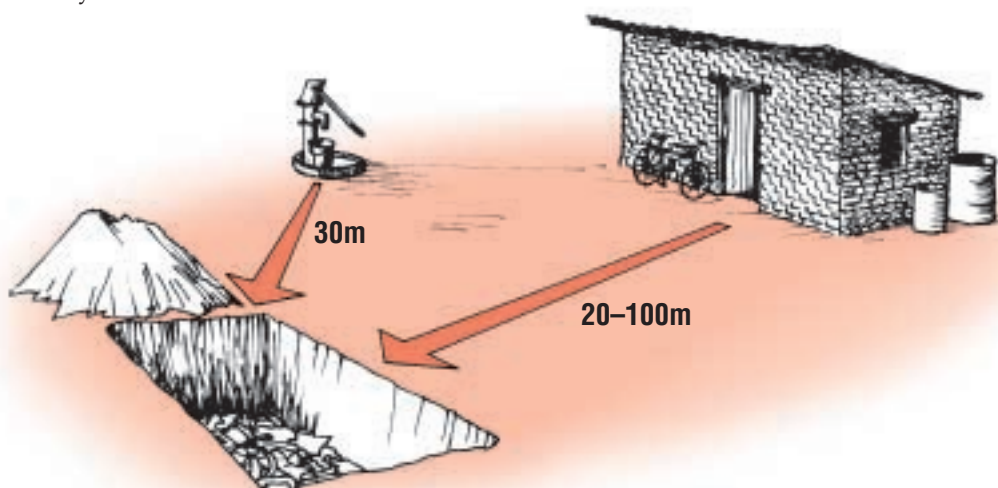


Digging the rubbish pit

The rubbish pit should be between 1m and 1.5m deep. It is a good idea to dig only about 1m of the desired length of the pit to start with. Otherwise the rest may fill with soil due to wind and water erosion.

CAUTION!

Care must be taken when handling waste to prevent cuts from sharp-edged scraps. Cleanliness is important to prevent the spread of disease. People should wash their hands after handling household waste, especially before preparing and eating food.



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