SMART EATING
Food & Climate Change

Learners' Booklet

CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

THIS CITY WORKS FOR YOU

Smart Eating – Food & Climate Change

Contents

The Smart Eating Toolkit was developed by icologie for the City of Cape Town – June 2010

1. Setting the Scene

The Smart Eating booklet aims to provide knowledge around the linkages between food and climate change, as well as to encourage and empower you to make informed and climate-friendly decisions regarding your food consumption.

Energy Requirements

There are several ways to produce energy, although the use of fossil fuels, such as oil, gas and coal, are currently our most common energy source. Unfortunately fossil fuels have negative impacts on our planet. We are dependant on energy in many different ways every day: heating and cooling our homes, lighting our schools, transporting ourselves from one place to another, powering our TVs and other home appliances, and so on. Our energy consumption can be obvious, such as when we fill our cars with petrol, but sometimes it can be a bit tricky to figure out how we depend on energy for our food such as the pesticides required to grow the food or petrol to transport the food.

Global Warming and Climate Change

A very serious consequence of our use of fossil fuels is global warming - a process that is already taking place and will continue to happen in the future. By using fossil fuels to generate energy, so-called greenhouse gases (GHGs) are emitted into the atmosphere. They are called GHGs because they trap the sun's rays in our atmosphere, which then gets warmer. We get the same effect as in a greenhouse or a car parked in the sun on a hot summer's day. The warming of our atmosphere is causing changes to the Earth's climate, and these climatic changes are likely to have negative impacts on our daily lives. It is therefore in our interest to do what we can to reduce our emissions of GHGs and to prevent further global warming.

The impacts of these climatic changes are expected to have a serious impact on our daily lives. We can expect more frequent flooding and storm surge events. There will be longer dry and hot periods with increased risks of fires, and due to droughts water shortages are likely to worsen in some areas.

Our food production and consumption is a significant contributor to climate change, as all the processes involved in putting food on our plates use a lot of energy, which often comes from fossil fuels. This means that the production of food generates GHGs, and thereby contributes to global warming and climate change.

Population Growth

Population growth is another aspect we need to consider. As our population grows, the demand for food will increase, and as a consequence food-related energy consumption will also increase. This places a lot of stress on our food production and consumption, which makes it important to make environmentally friendly choices when we decide what to eat.

Did you know that it takes about **16 kg of wheat, 7.5 liters of petrol** and almost **19 000 liters of water** to produce **1 kg of beef?**

Dead Zones

Conventional food production has many different negative environmental impacts that people are not aware of. Dead zones are areas in oceans or lakes with low-oxygen content where pollution of chemical nutrients in the water makes the water too rich in nutrients (a process also called eutrophication). This causes toxic algae blooms, which makes the water unsafe for drinking or swimming, and when the algae eventually die they use the oxygen from the water to decompose. The oxygen in the water is then depleted and this means that fish, plants and other organisms that live in these zones slowly disappear because there is no oxygen left. Runoff from sewage, urban land-use and agriculture are the main causes of eutrophication, and the livestock sector is a big contributor. Conventional agriculture uses large amounts of chemical fertilisers, which is very high in nutrients that eventually end up in our water bodies and contribute to the creation of dead zones.

Did you know that chemical fertilisers are the main cause of **dead zones** in our oceans and lakes?

Healthy Food

Living sustainably is not only about having a small carbon footprint and making choices that do not harm the environment; it is also about investing in our health and our future. It is interesting that healthy food is usually more environmentally friendly than unhealthy food, such as local, seasonal or organic food. By making environmentally friendly (or 'green') choices in terms of what we eat, we will also make healthy choices.

The good news is that what we eat is something that we as individuals often can influence! This means that we can all make a difference. Taking care of the planet is also taking care of ourselves.

It is important to consider the food you eat, because it impacts on your health and energy levels, as well as how you look and feel

What can we do – we all need to eat?

What can we do to reduce the carbon footprint of our food and its impact on the Earth's temperature? There are two important things we can do:

1) Adaptation: Learn about the consequences of our food production and the links to global warming and climate change so that we can adapt accordingly and make the right choices.
2) Mitigation: Take actions aimed at reducing the GHGs emitted through our food production, and learn how to use energy more efficiently, as well as reduce the amount of waste related to food consumption.

This booklet will specifically look at the following aspects relating to food:

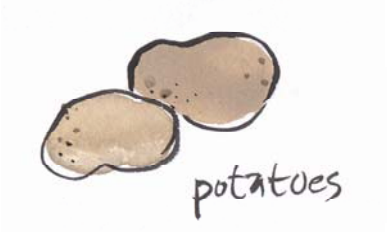
- Production and what is needed to make the food
- Packaging and the waste associated with this
- Transport for food and the concept of food miles
- Storage requirements for food
- Preparation of food
- Health, including nutrition and pesticides
- Water requirements relating to food

Did you know that **18%** of the CO2 emissions cause by humans come from … (guess)

Answer: the livestock sector

You will also find additional reference material at the end of the booklet, as well as an audit sheet to assess the impact of your food on the environment in a very basic manner relating to the aspects mentioned above.

Did you know that a **vegetable-based diet** requires only 6% of the water required for a meat-based diet?



2. Production

Producing food requires a lot more than what we first think of, and it is not always easy to identify all the factors! We need resources such as water, electricity, machines, tools and certain climatic conditions to produce food...and what else? One thing is clear though, and that is that all factors need input from energy somehow. Over 90% of the energy produced in South Africa is fossil fuel-based, which means that our food production and consumption clearly contribute to GHG emissions.

Did you know that **12%** of South Africa's land area is cultivated and most food is produced for domestic needs?

Most of the food that we consume is grown through **conventional** food production, which requires large amounts of fertilisers, pestisides and mechanical equipment. **Organic farming** is an alternative form of agriculture that requires crop rotation, green manure, compost, and mechanical cultivation to maintain soil productivity. It also uses pest control that excludes, or strictly limits, synthetic pesticides, plant growth regulators, livestock feed additives, and genetically modified organisms. Animals that have the opportunity to roam freely in a natural environment, not being confined indoors are **free range**.

Let's consider two examples of conventional food production:

1) ***Farmer growing beans:*** *For that he needs seeds, a plot of land, water, sunshine and maybe fertilisers and pesticides. When the beans are ready for harvest he needs machines and tools to harvest them. The machines run on oil and they need to be washed with water, as do the tools. The beans will then either be dried or used fresh, in which case they need to be kept cool.*

2) ***Farmer with cows:*** *He needs land for the cattle to graze on or a barn and grain if they are grain fed. He might feed cattle with food based on soya beans and the cattle also need water to drink. He might possibly add hormones and antibiotics to the cattle's food so that the animals will grow better and stay healthy. When the cattle are ready for slaughter he needs machines, tools and water, where after the meat will have to be transported to the butchery and then to the stores. The meat will be frozen or sold/eaten straight away, and then it needs to be kept cool to stay fresh.*

Did you know that worldwide we chop down **24 hectares of rainforest every minute**, to feed and graze cattle? This is equivalent to **40 soccer fields**.

The second example requires much more energy as the cattle feeds on soy beans that first had to be grown and harvested like in the first example. Even if the cattle

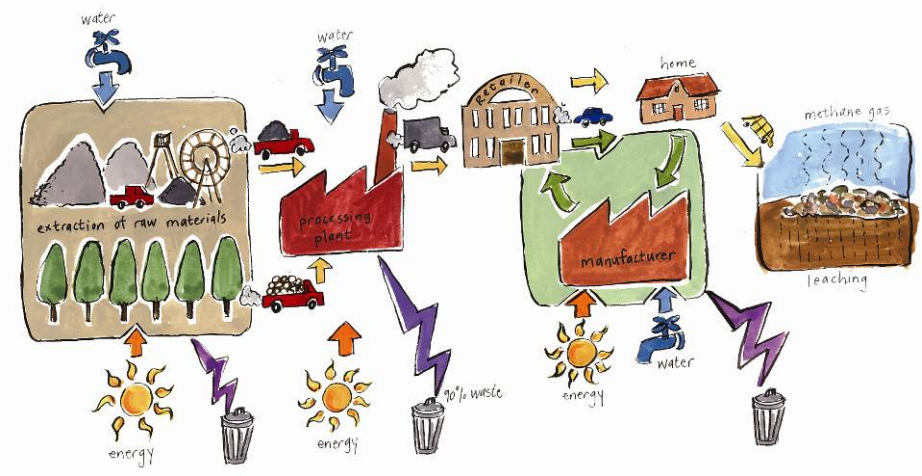
are grazing, it still requires much more land than growing beans. More water is needed too, and transportation of water is another process that requires energy. To freeze and cool food takes a lot of energy and so does drying, but sun-drying would be a less energy-intense alternative. Manufacturing fertilisers, pesticides and hormones requires energy and can have negative impacts on our health, as well as the environment, so it is best to avoid them when possible.

Summary:

- The fewer components (cattle feed, pesticides, hormones, water etc.) involved in the food production - the less energy is required.
- The less processes (harvesting, slaughtering, drying, freezing etc.) the food goes through – the less energy is required.
- The closer the food we eat is to its original state (fresh rather than processed food) – the less energy is required.
- The less energy that is required, the smaller the impact on the environment.
- By choosing seasonal and organic food instead of conventional food our carbon footprint will be lower and it will be less harmful to the environment.

3. Packaging & Waste

Waste is generated in all steps throughout the food cycle, such as packaging, waste water and organic waste (bits and pieces of plants and animals that we do not eat). All the components that are used to make packages, to transport and clean the water, and to produce the actual food, are involved in complex processes that all use energy. Even disposal of waste requires energy input as it has to be transported to a landfill.



Energy and water is required all along the process of manufacturing food, while waste is generated. A life cycle analysis (LCA) consideres the whole process and not just the final product.

It is also worth thinking about the **landfills** (rubbish dump) for a moment. What happens to the waste once it is put in a landfill? Unfortunately the waste is left there for storage. Some waste will degrade and become new soil, but some (like plastic bottles) will remain for a very long time. In some cases landfills have leaked toxins into the soils of surrounding areas, which is harmful to the people, plants and animals that are living there.

A **foodbank** is an organisation that collects and distributes food on behalf of the needy. They provide a link between local service organisations and organisations that donate food and groceries, such as chain stores, hotels and other organisations. The foodbank defaces the branding to protect the interests of the donors. The foodbank safely stores this food in hygienic conditions; using refrigeration where required, sorts it into nutritionally sensible packages, and makes it available or delivers it to the needy through local organisations. This is a practical way to avoid food waste going to landfill.

What choice would be better in terms of the amounts of waste it generates?

1) *The first store has loose carrots, onions, potatoes and cabbage in trays. You choose how many you want – and which ones you want – and you put them in plastic bags, price them, pay and take them home. When preparing this food you will generate waste in the form of the plastic bags, the skin you peel off and water you use for washing the vegetables.*

2) *The second store has carrots, potatoes, onions and cabbage that are already packed in plastic bags and some of it is also packed lying in polystyrene trays. The weight and the price are also fixed. When preparing this food you will generate waste in the form of plastic bags, trays, the skin you peel of and the water you use for washing the vegetables.*

Did you know that a plastic bottle takes up to **450 years** to decompose?

It may seem that the difference between the two is not very big, but if you think about it, store one offers you more choices. You can choose the vegetables that are nice and you can choose exactly how many you want. To save plastic bags you can even put the price tag directly on the cabbage – you don't really need a plastic bag for this – or you can re-use the bags. The pre-packed vegetables often lie in plastic bags that are thicker than the bags you pack yourselves, and these take longer to degrade in a landfill.

The best option is of course to buy from a local farmers market and take your own re-usable shopping bag along as this will reduce the amount of waste generated. Waste can either be recycled, or if it is organic waste it can be made into compost.

Summary

- **Reduce, re-use and recycle** – these are the three things to remember, but wherever you can you need to avoid the creation of waste in the first place.

  - By **avoiding packaging** you generate less waste and use less energy.
  - You can make a difference by small choices such as choosing products with **less packaging** - it is easy and will make a big difference.
  - Consider how you can **re-use** packaging instead of throwing it away. Take a fabric bag along instead of getting plastic bags when you shop.
  - By **recycling** your waste you won't add to the landfills and you contribute to making our planet cleaner – see the Smart Living Handbook for tips on recycling.
  - Do not litter your **waste**, but make sure that it is disposed of responsibly.

- **Avoid** the following materials which are not easily recyclable:

  - Plastic that doesn't have the 'poly logo' and number on it - normally this means it is not recyclable as it's a composite of various types of plastics.
  - Sweet wrappers and chip foil packages
  - Cellophane wrappers
  - Clingwrap
  - Wax coated cardboard boxes (for example in certain fruit boxes)
  - Tetrapack (cardboard/plastic mix containers such as those containing some long life milk and fruit juices).

- Fruit and vegetable peels or other **organic** waste such as tea bags, eggshells, etc can be placed on a compost heap. Avoid adding cooked meat or protiens to your compost heap, as this could attract rodents.

4. Transport

Food is transported for much longer distances than our trips back and forth to the store. The food needs to be transported from where it is produced to factories for processing. From the factories it has to be transported to a distribution centre, then to the stores and finally to our homes.

Food is grown / produced in different parts of the country and needs to be transported for our needs. If we choose food that is grown locally or regionally, the transport requirements are lower and the food that we get is fresher. There are many different ways in which food gets transported. We need fuel for planes, trucks, boats and trains, and we mostly need fossil fuels that contribute to global warming.

Some of the food we eat travels from other continents before we get it. If food is imported from another country (sometimes indicated on the packaging although not a legal requirement), it had to be transported over a long distance mostly by boat or plane. The best is to grow our own food in our garden if at all possible.

Food Miles

Food miles is a term which refers to the distance food is transported from the time of its production until it reaches the consumer. It is a tool used for assessing the environmental impact of food.

When you order a take-away pizza from down the road you hope that it arrives warm, but you don't think about the distance all the ingredients have travelled. The example below gives you an idea of how complex a seemingly simple thing as a pizza can be in terms of food miles, carbon emissions and the food we eat. All the different ingredients used to make the pizza, including the base and the toppings, need to be transported from where they are produced.

<u>Pizza ingredients:</u>
Wheat from Malmesbury (70km) and Argentina (8 000km)
Tinned tomato from Italy (9500km)
Olives from Italy (9500km)
Anchovies from Spain (9500km)
Pineapple from KwaZulu-Natal (1 750km)
Mushrooms from Gauteng (1 450km)
Mozzarella from Gauteng (1 450km)
Avocado from Spain (9 500km)
Lettuce from Paarl (50km)
Onions from Free State (1 100km)

Fresh tomatoes from Israel (8500km)
Cucumber from Eastern Cape (850km)
Feta cheese from George (450km)
Olive oil from Spain (9500km)
Balsamic vinegar from Italy (9500km)

The pizza's food miles add up to 80697km, which still does not include all stages of the food's life cycle (www.food24.com). What do you think should be added here in terms of energy-use for the pizza?

Have a look at the two examples below:

1) ***We are having fish for dinner**. We chose an imported fish which is transported here by plane to stay fresh and it has to be kept cooled or frozen. The fish was grown in fish-farms and fed with fish feed which is made from other smaller fish species which have traveled (frozen) between different continents before it gets eaten by the factory-farmed fish. This process is common in developed countries, as it is cheaper to produce the fish feed in developing countries and then to import it to the fish farms.*

2) ***We are having chicken for dinner**. We go to the store and buy chicken from a local farm. The chicken is grain-fed and free-range. This chicken has traveled from the farm to the butchery, then to the store (frozen or cooled) and then to our homes.*

*The imported fish uses **much more** energy than the chicken before ending up on our plates. It has been to three different continents and has travelled long-distances by boat, plane and trucks. On top of that it had to be kept frozen and cooled not to go bad, as had the fish feed. The chicken has travelled as well, but much shorter distances and even though it had to be kept cooled or frozen, it was for shorter periods and distances. Some chicken is however treated with hormones and antibiotics which can have negative impacts on our health and the environment, but if the chicken is free-range that is less likely.*

Summary

- Chose local or regional food – it uses less energy for transportation than food imported from other countries and is usually fresher.
- Food miles indicate the distrance that food travels from production till plate.
- The shorter distance that food travels, the less fuels is needed and the fewer emssions and GHGs are emitted into the environment and atmosphere.
- Some food has to be frozen or cooled when transported, so the longer the transport takes, the more energy is required for freezing or cooling.

5. Storage

Some types of food need to be stored under special conditions to stay fresh and safe. Even before the food reaches the stores it often has to be kept in cooling or freezing facilities. Fridges and freezers are used during transportation, in shops and in our homes. All of this cooling and freezing requires a lot of energy, and the more places the food visits before ending up on our plates, the more storing processes it goes through, and the more energy is consumed. Food that can be kept in open air at room temperature requires the least amount of energy.

Practical tips

Here are some useful tips on how you can store your food properly and reduce your food's carbon footprint, environmental impact and your electricity bill:

Always try to buy fresh, local, seasonal and organic food.

- Choose local food. Less transport is required and has therefore not been using so much energy for cooling and freezing. It will also be fresher.
- Buy fresh instead of frozen food. It will usually taste better and have a higher nutritional value; it also supports the local community and has less negative impact on the environment.
- Make sure that your food is stored properly. This will make it last longer and stay fresh. Not all food is suitable to store in the fridge.
- Let your cooked food cool down properly before you put in the fridge. Warm food requires the fridge to use more energy for keeping the appropriate cold temperature.
- Make sure that your fridge and freezer close properly. You should also defrost them on a regular basis. Don't leave the doors open longer than necessary!
- If you have a freezer – keep it full. The frozen items will cool each other inside the freezer, but an empty freezer will just use energy for nothing and cold air will escape when you open the door.

Now that you know how to store your food in a climate-friendly way you will soon realise that by saving energy you will also save money!

6. Eco Procurement

Sustainable, green or eco procurement is when the purchase (buying) of goods or services takes environmental and social aspects into account. It is important to consider the best value for money (price, quality, availability, functionality); environmental aspects over the entire life cycle of products; and social aspects (issues such as poverty eradication, labour conditions and human rights).

In short, eco procurement is shopping with a conscience. When you buy your food you have the opportunity to choose local, seasonal and organic food with minimal packaging. This can impact on the production process, the packaging and the distance that the food travelled. This choice is made when you decide what you buy.

Did you know that **small farms** often use water and fuel more efficiently than large farms?

Practical tips

Here are some tips for when you do your shopping:

- **Honey:** Buy badger-friendly honey, which is harvested without harming the near-threatened honey badger.
- **Meat:** Buy free-range meat and chicken and ask if the suppliers comply with predator-friendly and sustainable farming practices.
- **Wine:** Buy wine that participate with the Biodiversity and Wine Initiative (BWI) and have committed to sustainable wine production in an effort to conserve the Cape Floral Kingdom.
- **Fish:** Buy fish that is harvested sustainably - you can SMS the name of the fish to SASSI's FishMS on 079 499 8795 for an instant reply on the status of the fish to check if it is harvested sustainably.

7. Preparation

So when can we eat? The food has been produced, it has been transported, it has been wrapped and unwrapped, we have looked at the health impacts and we now have it properly stored at home. However, unless you eat all your food raw, the preparation (cooking) requires energy as well. The good news is that there are lots of small things you can do to be energy-efficient when you cook - and as you already know, by saving energy you also save money.

We have decided to have chicken and potatoes for dinner. Of the two examples below, which one do you think is the big energy-consumer?

1) ***We make oven-roasted chicken and baked potatoes.*** *For this we need to use the oven, and first we bake the potatoes and then we roast the chicken. When the chicken is almost done, we turn the oven off and leave the chicken to finish roasting on the remaining heat. We also put the potatoes back in to re-heat them.*

2) ***We make a chicken stew in a pot****. First we have to fry the chicken for a little while in a pan. While the chicken is simmering in the pot, we heat up oil in the pan and make chips out of our potatoes.*

The key here is how we use our oven. If we use it in an energy-efficient way, then the first example is the best option. It is also the healthiest, because deep-fried food, like chips are very high in fat, and a lot of the nutrition in potatoes is removed through deep-frying. Deep-frying is also by far the most energy-consuming way of cooking: 40MJ per kg compared to 29MJ per kilo for baked potatoes. Boiled potatoes (4.6) would be the best option from an energy perspective.

If we use the oven carelessly, like opening the door many times, leaving foor in on for too long, and not making use of the remaining heat once it's turned off – then the energy-consumption for the first example increases. Another option is to use a hot-box or slow cooker to save energy when cooking your chicken and potatoes.

Practical tips

Make sure you implement the following basic principles:

- Use a kettle to boil water for pasta, rice, potatoes, pap, veggies and so on. The kettle uses less energy to get the water boiling than putting the cold water directly into the pot and then heating it up.
- Turn the stove off when you are nearly done cooking and let the food cook on the residual heat. Try it – you will see that it stays warm longer than you think!
- Make sure that you cook several things at the same time when you use the oven, because an oven uses lots of energy. It uses more energy to heat the oven than to keep it warm once it is already heated. You can also turn it off a while before the food is ready and make use of the residual heat. You should also check that the oven door closes properly. Plan your oven use and make it more energy-efficient!
- Deep-frying of food requires a lot of energy. Of all the alternatives on how to prepare your food this is probably the most energy consuming option. It also uses a lot of oil and it is very unhealthy.

- Cook with a lid on the pot when using the stove. Without a lid a lot of the heat will get lost, but if you use a lid the heat will stay concentrated to the pot. By placing a folded up kitchen towel on the lid it will contain the heat even better (don't do this if cooking on an open flame).
- Consider the water you use when preparing your food and doing the dishes. Try not to waste water, only boil as much as you need and don't rinse your dishes under the tap, but rather use a separate wash-basin.

8. Health

Food that has been industrially processed often looses a lot of its nutritional value. Processed food usually contains additives, such as colourants, preservatives, stabilisers and flavour enhancers, which are potentially harmful to us and our planet. Some additives that are put into our food may still have unknown consequences for our health if we continue to use them.

Did you know that food that has been **industrially processed** often contains a lot of empty calories, preservatives and additives, with very little nutrition!

Pesticides, fertilisers and hormones are frequently used in food production to make it more efficient and profitable, but they also impact upon our health and the planet. Contamination and eutrophication of waters and hormonal disruptions with certain animal species have been directly linked to the use of these substances. When livestock is treated with hormones and antibiotics, we end up with some of it in our bodies when we eat the meat. Antibiotics resistance in humans has for example been linked to this, and the long-term impacts on human health are still unknown.

Besides the negative impacts on our health, the processing of food requires energy, and so does the manufacturing and use of additives, pesticides, fertilisers and hormones. All of this therefore adds to the total carbon footprint and environmental impact of the food.

What would be a healthier and a more climate-friendly option?

1) *A lunch where you have bread and cheese, a glass of water and a fruit?*
2) *A lunch where you have a bag of chips, a soft drink and a chocolate bar?*

The first option is definitely the best option and it is much cheaper too! The fruit is not processed at all and it is high in fibre and vitamins, which keeps you full and alert longer. Water from the tap (if it is safe) is for almost free and has a very low carbon footprint compared to a soft drink. The bread and the cheese is processed, and they both require quite a lot of energy to produce, but compared to chips (which are deep-fried) and the chocolate bar, the bread and cheese still wins by far. Option two also uses more packaging and contains additives. Both the cheese and the chocolate contain dairy products which add to the carbon footprint.

Summary

- Healthy food often has a low carbon footrpint and is cheaper
- The less processed food is, the more nutritious it is and the more climate-firendly it is.
- More energy is required when there are more components from different sources in your food.
- Meat that is produced organically or free-range is a better option from a health perspective. You should also ask at your food-store if substances like hormones, pesticides and antibiotics have been used to produce the food they are selling and try to avoid this.
- Eating healthy food is important for doing well at school.

9. Drinking water

Bottled water is a growing industry worldwide and in South Africa. From an energy, cost and waste perspective it is however much better to drink tap water instead of buying bottled water – provided the tap water is clean of course, but fortunately South Africa generally has clean water in urban areas.

Here are some facts and figures around bottled water:

- Bottled water is 1000 - 5000 times more expensive than tap water.
- 196 million litres of bottled water was consumed in South Africa in 2006 - this is estimated to reach 568 million litres by the 2010 World Cup.
- In 2006 consumption of bottled water generated 98 000 tonnes of CO_2 emissions in South Africa – this is enough to electrify 35 507 low-income households for one year.
- To produce one litre of bottled water, 26 litres of water is required and 1kg of fossil fuel. This generates an estimate of 0.5kg of CO_2 emissions.
- Bottled water generates 1000 times more CO_2 emissions than tap water, and if the bottled water is transported by plane from other countries, the numbers increases.
- A plastic bottle that ends up in a landfill can take up to 450 years to decompose.

Did you know that it takes **26 liters** of water to produce **1 liter** of bottled water? It also uses **1 kg of** fossil fuel which causes **0.5kg of CO_2**.

Why do you think bottled water is becoming so popular? Why do you think bottled water is transported by plane into South Africa from other countries when we have our own tap- and bottled water? What do you think we should do to solve this problem?

10. You are not alone – change is happening

It may seem like an impossible task to change the world's food industry, but it is not. If you think that your own personal changes will not make a difference you should remember that many people have already adapted to more climate-friendly lifestyles and the awareness of how food is related to climate change is growing. Awareness is also growing around organic farming, clean and green technologies, and food miles.

Even on the big multi-national level it is recognised that change needs to happen if we are going to feed a growing population and meet the challenges of climate change. Individuals, organisations, governments and corporations are starting to respond to this in numerous creative ways, like making climate-friendly lifestyle decisions, developing environmental labelling of food, switching to cleaner and more efficient technologies and more sustainable production.

This booklet provides you with some easy things that you can do to reduce your own carbon footprint and energy consumption, and if you do it together with your friends it will have an even greater impact.

11. How to do a tuck shop audit

To encourage you to make a change within your school environment we have compiled a simple audit sheet to be used at your school or at home. You need to assess the various food types available at your school's tuck shop and score them according to the different impact areas such as production, transport, packaging etc. This will then give you a simple analysis of how different food types impact on climate change in different ways, and what you can do to make a difference.

Below is an outline of different food types and impact areas, as well as an example of how to fill in the tuck shop audit sheet. You need to consider all the different items individually to determine where they come from and what their impact is.

Food type:

- Describe the type of food to be assessed, e.g. chocolate bar, chips, fizzy drink, ice lolly, apply, carrot, meat pie, etc.
- If unsure, break it down and take an average, e.g. hamburger consists of a bread bun, patty, tomato, cheese, etc. Add the score up and divide by the number of items.
- If there is a mixture of items, then always use the "worse case", e.g. if both polystyrene and paper is used, then score the polystyrene.

Production:

Organic seasonal	0	The best choice is organic, local, seasonal fruit and vegetables
Organic / Free range	1	Agriculture without pesticides, artificial fertilisers, genetic modification and sewage waste, as well as livestock that is reared free range
Conventional, but seasonal	2	Seasonal fruit or vegetables from standard farming techniques.
Conventional	3	Standard farming techniques out of season

Packaging

No packaging	0	No packaging associated with product, e.g. carrots from food garden
Recycled	1	Packaging that is already being recycled at the school e.g. tin cans, glass bottles, cardboard, plastic bottles with a poly logo such as PET
Recyclable	2	Packaging that can be recycled at the school in the future e.g. tin cans, glass bottles, cardboard, plastic bottles with a poly logo such as PET
Non-recyclable	3	Packaging that cannot be recycled e.g. cling wrap / tin foil / chips bags / polystyrene / tetra pack (juice carton box with foil, cardboard and plastic composite)

Transport

Home / school	0	Made / grown at home or school
Local / Regional	1	Cape Town or Western Cape Region
National	2	Anywhere within South Africa, including Lesotho and Swaziland
Southern Africa	3	Imported from within Southern African region
Imported	4	Imported from any other country world wide

Storage

Open Air	0	Any open air or pantry storage, e.g. chips, fruit, sweet
Refrigerate after opening	1	Products that need to be refrigerated only after opening.
Fridge	2	Products that need to be kept in a fridge, e.g. cold drinks, milk, cheese.
Freezer	3	Products that need to be kept frozen

Preparation

Raw	0	Any products that are consumed without any cooking e.g. fruit, uncooked
Cooked	1	Any products that need to be cooked or re-heated locally before consumption e.g. home made lasagne
Deep fried	2	Any products that are deep fried on-site e.g. fish and "slap" chips
Processed	4	Products that have been processed in a factory, e.g. chocolate, bread, meat pies, chips.
Processed & reheated	4	Processed products that need to be reheated

Based on the criteria above you can score the food at your home and schools to determine their impact on the environment. Consider each of the food items and provide them with a score for each of the different categories. This will help you to determine what the best choices are that you can make. We have provided to examples to illustrate how this works.

The following items have been included into the first example below:

- Chocolate bar made under license in Durban, with some imported ingredients
- Packet of chips imported from USA
- Fizzy drink made in Johannesburg with an imported formula
- Ice lolly made in Italy
- Organic apples grown in Ceres, out of season
- Carrots from the school food garden, grown organic and in season
- Meat pie made in Atlantis

SMART EATING: FOOD AND CLIMATE CHANGE AUDIT SHEET																		
DATE:							**TEAM:**											
VENUE:							**NAMES:**											
FOOD TYPE	**PRODUCTION**		**PACKAGING**				**TRANSPORT**				**STORAGE**			**PREPARATION**				**TOTAL**	**COMMENTS**
Describe the type of food to be audited	Organic	Conventional	None	Recycled	Recyclable	Non-recyclable	Home / School	Local / Regional	National	Imported	Open air	Fridge	Freezer	Raw	Cooked	Deep fried	Processed	Total number of points per food item – less is more	Any comments that might influence scoring
POINTS	0/1	2/3	0	1	2	3	0	1	2	3/4	0	1/2	3	0	1	2	3/4		
Chocolate bar		3				3				3	0						3	12	Made in Durban, some imported bits
Chips		3				3				4	0						3	13	Imported from europe
Fizzy Drink		3			2				2			1					3	11	Made in JHB, some elements imported
Ice Lolly		3				3				4			3				3	16	Imported from Italy
Apple	1			1				1			0			0				3	Organic, Ceres, out of season
Carrot	0		0				0				0			0				0	Organic, Food garden, in season
Meat Pie		3				3		1				2					4	13	Made Locally
TOTAL																			**TOTAL**

An item such as a hamburger can either be calculated as a whole, or as individual items with an average as outlined below. See the description for the details of the individual items used to prepare the hamburger.

SMART EATING: FOOD AND CLIMATE CHANGE AUDIT SHEET																		
DATE:							**TEAM:**											
VENUE:							**NAMES:**											
FOOD TYPE	**PRODUCTION**		**PACKAGING**				**TRANSPORT**				**STORAGE**			**PREPARATION**				**TOTAL**	**COMMENTS**
Describe the type of food to be audited	Organic	Conventional	None	Recycled	Recyclable	Non-recyclable	Home / School	Local / Regional	National	Imported	Open air	Fridge	Freezer	Raw	Cooked	Deep fried	Processed	Total number of points per food item – less is more	Any comments that might influence scoring
POINTS	0/1	2/3	0	1	2	3	0	1	2	3/4	0	1/2	3	0	1	2	3/4		
Burger		2				3			2				3		1			11	
Bread		2				3			2				3		1			11	Local, Frozen, Plastic bags
Onions		3				3		1			0				1			8	Local, plastic bags, out of season
Tomatoes	0					3		1				2		0				6	Regional, plastic, organic, in season
Burger		2				3			3				3		1			12	Frozen, processed
Ketchup		2				3			3		1						3	12	Plastic sachets
Cheese		2				3		1				2					3	11	
																		60	Total
																		10	Average
TOTAL																			**TOTAL**

The hamburger comprises of the following items:

- Bread made locally, but delivered frozen in plastic bags.
- Onions grown locally, but delivered in plastic bags
- Tomatoes grown in Ceres (regional) and delivered in plastic bags
- Burger delivered frozen, with some processing involved
- Tomato sauce which is processed in a factory in a plastic bottle
- Cheese which is processed, with plastic wrapping and needs to be refrigerated

12. What you can do

At Home:

- Eat more fresh vegetables, fruit and grains.
- Eat less meat - buy meat where animals have been able to roam freely and are free of antibiotics and hormones.
- Buy in bulk to reduce packaging and waste
- Buy local, seasonal and organic food when possible
- Avoid disposable paper and plastic products when shopping – put the price tags directly on fruit and vegetables instead of using plastic bags
- Drink tap water instead of buying bottled water and soft drinks – it is cheaper and better for the environment and you
- Support local community food gardens such as Harvest of Hope

In your local community:

- Support local food products
- Encourage local stores and restaurants to carry local and organic products
- Ask local stores and restaurants about the sources of the food they sell
- Ask local stores and restaurants not to sell food with large carbon footprints, like imported exotic fish and fruit
- Find out where your nearest recycling is

At work or school:

- Support local food producers when catering events
- Request that mainly local and fresh food should be served on the premises
- Ask for reusable mugs, silverware and plates instead of disposable
- Ask for recycling bins
- Ask for healthy food in your tuck shop or canteen
- Eat fruit and vegetables for snacks instead of processed food

13. Some useful links

Resources

Abalimi Bezekhaya: food gardening
www.abalimi.org.za

Carbon Footprint Calculator: carbon calculator
www.platbos.co.za/carbon_calculator.html

Enviropaedia: resource directory
www.enviropaedia.com

Foodbank South Africa; food redistribution (Feedback)
www.foodbank.org.za

Full Cycle - composting
www.fullcycle.co.za

Greater Good SA
www.ggsa.co.za

Green Map Cape Town: local directory with local information
www.capetowngreenmap.co.za

Greenspace: local directory
www.greenspace.co.za

Harvest of Hope; organic food boxes delivered to your school
www.harvestofhope.org.za

IPCC: Intergovernmental Panel on Climate Change
www.ipcc.ch

SASSI: Sustainable Seafood Initiative
www.wwfsassi.co.za/home.asp?m=1

Schools of Environmental Education and Development
www.seed.co.za

Smart Living Handbook: resource book
www.capetown.gov.za/environment

South African Weather Service
www.weathersa.co.za/References/Climchange.jsp

The Southern Energy Network
www.climateaction.net

The Story of Stuff – including the Story of Bottled Water
www.storyofstuff.com

Urban Sprout: local directory and blog
www.urbansprout.co.za

WARMTH : War against malnutrition, tuberculosis and hunger
www.warmth.org.za

A Few Products

Camphill Farm: natural and organic products
www.camphill.org.za
Elgin Organics: organic fruit and fruit juice
www.elginorganics.com
Ethical Co-op: online organic shop
www.ethical.org.za
Faithful to nature: online organic shop
www.faithfultonature.co.za
Greenhome: biodegradable and compostable food packing
www.greenhome.co.za
Good for the ground: biodegradable and compostable films bags
www.goodfortheground.com
Health Connection Wholefoods
www.health-connection.co.za
Komatifoods
www.komatifoods.co.za
Neighbourgoods Market
www.neighbourgoodsmarket.co.za
Organic Living: organic shop
www.organicliving.co.za
Stellar Winery: organic wine
www.stellarorganics.com
Superfoods
www.superfoods.co.za
Tierhoek Organic: organic jam, jellies and dried fruit
www.tierhoekorganic.com
Wellness Warehouse
www.wellnesswarehouse.com

It stinks!

Grain-fed cows often can't digest their fodder well. **The belching and farting from animals produces 16% of our methane emissions.**

Glossary

Additives	Food additives are substances added to food to preserve flavour or improve its taste and appearance.
Adaptation	The process whereby an organism becomes better suited to its habitat – adapting or changing to make it more fit for existing under the conditions of its current environment. Adaptation to global warming refers to taking action to minimise the impacts of global warming.
Carbon footprint	The total set of greenhouse gas emissions caused directly and indirectly by an individual, organisation, event or product over a specific period of time.
Climate change	Natural cycle through which the Earth and the atmosphere accommodate the amount of energy received from the sun. Here referring to the climate change taking place through human impact.
Carbon dioxide (CO_2)	One of the most well-known greenhouse gases and the unit used for comparing or measuring other emissions.
Dead zone	Low-oxygen (hypoxic) areas in the world's oceans, meaning areas in the oceans where living organisms cannot survive.
Eco procurement	Consideration of environmental and social principles when purchasing products or services.
Energy	Here defined as secondary energy, such as electricity, fuel for transport and other energy inputs required for food production.
EU	The European Union.
FAO	The Food and Agriculture Organization: United Nations largest autonomous agency.
Food	Food is any substance or material eaten to provide nutritional support for the body or for pleasure. It usually consists of plant or animal origin that contains essential nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals.
Food miles	The distance food has travelled from field to plate.
Fossil fuel	Fuel formed by anaerobic decomposition over a long period of time, such as coal, oil and gas.

Free range	Animals that have the opportunity to roam freely in a natural environment, and not being confined indoors.
GHG	Greenhouse gas: Gases in the atmosphere that absorb and emit radiation from the sun and thereby contribute to warming the Earth.
Global	Something that is effecting and happening all over the world. *'Think global, act local'*
IPCC	Intergovernmental Panel on Climate Change – a scientific body tasked by the UN with evaluating the risk of climate change caused by human activity.
Local	Something occurring at a specific place on a smaller scale, also something that is close to the point of reference. The opposite of global.
Methane gas (CH_4)	A GHG with high global warming potential. Produced by landfills, livestock etc. Also called 'marsh gas'.
Mitigation	Mitigation of global warming involves taking actions aimed at reducing the extent of global warming.
MJ	Megajoule: Joule measures the amount of energy that is required to perform a certain action. One Megajoule has 1 million joules.
Nitrous oxide (NO_2)	A major GHG, known as 'happy gas' or laughing gas'.
Organic Agriculture	Agriculture that is produced without pesticides, artificial fertilisers, genetic modification and sewage waste.
Pesticides	A pesticide is a substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest.
Polluter pays principle (PPP)	The producer of pollution is responsible for paying for the damage done to the natural environment.
Preservatives	A natural or synthetic chemical that is added to products such as foods, pharmaceuticals, paints, biological samples, wood, etc. to prevent decomposition by microbial growth or by undesirable chemical changes.
Sustainable	Something (a practice, a system, a lifestyle etc.) that can continue in the long-term without having negative impacts on the social, economic and natural environment.
WHO	World Health Organisation