

## Food and the environment

**Feeding the world**

**Food in crisis**

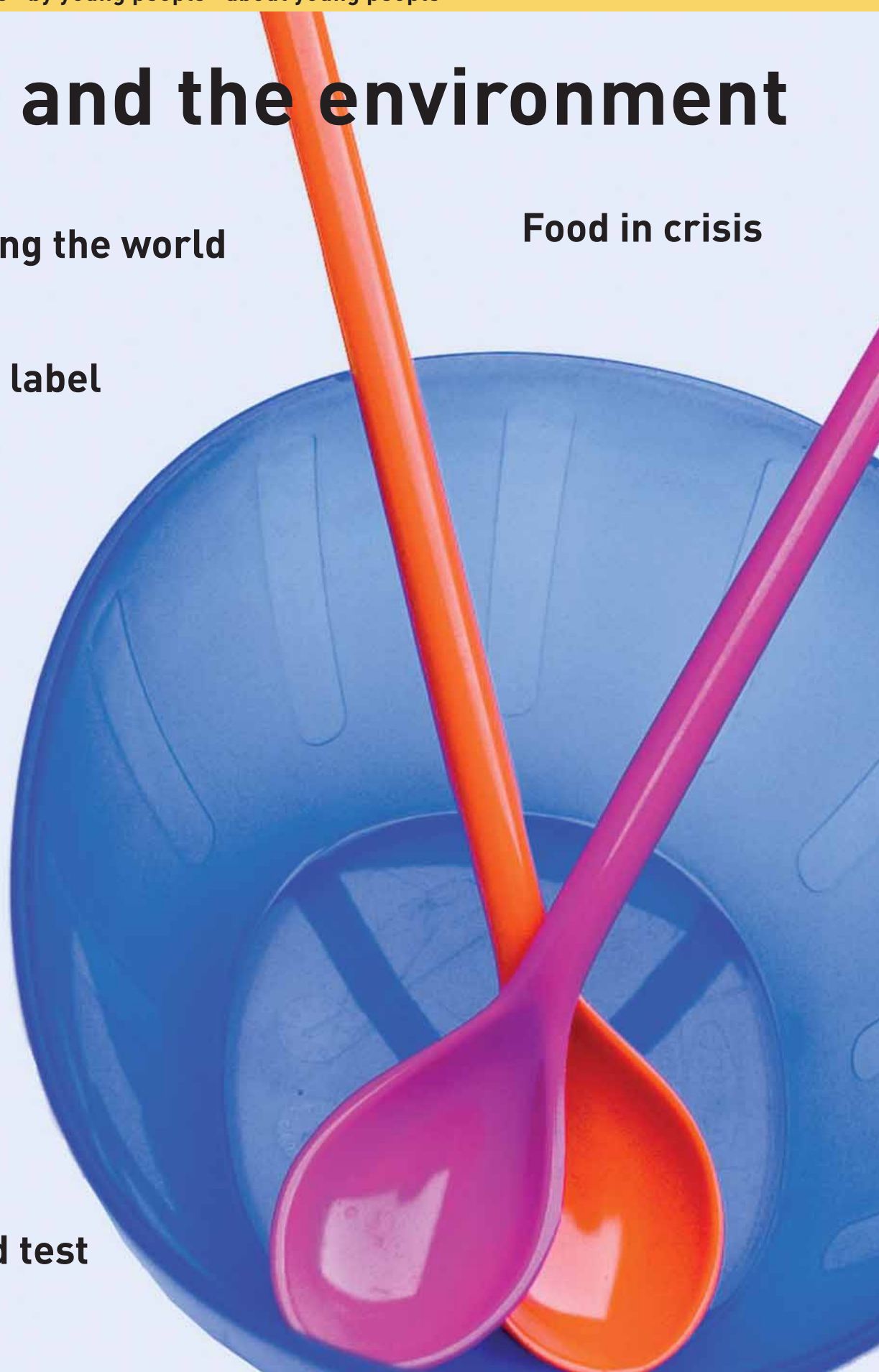
**Check the label**

**Organic  
dilemma**

**A fair fight**

**Eat less  
meat?**

**The acid test**



## TUNZA

the UNEP magazine  
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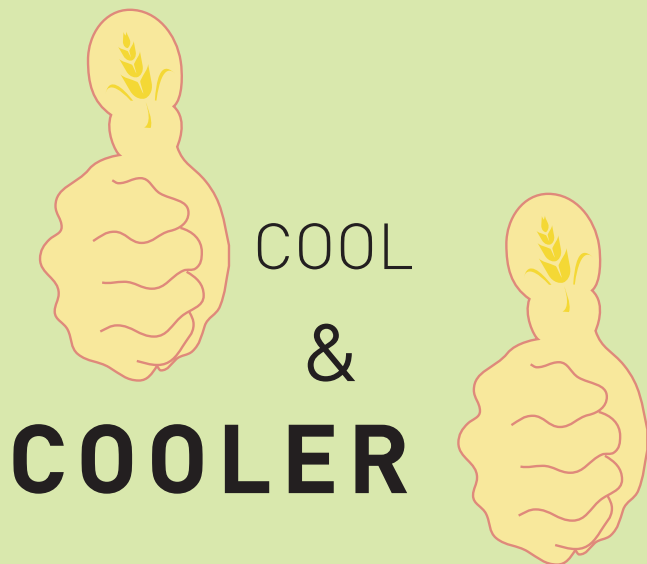
## Partners for Youth and the Environment



**UNEP and Bayer, the German-based international enterprise involved in health care, crop science and materials science, are working together to strengthen young people's environmental awareness and engage children and youth in environmental issues worldwide.**

The partnership agreement, renewed to run through 2010, lays down a basis for UNEP and Bayer to enlarge their longstanding collaboration to bring successful initiatives to countries

around the world and develop new youth programmes. Projects include: TUNZA Magazine, the International Children's Painting Competition on the Environment, the Bayer Young Environmental Envoy in Partnership with UNEP, the UNEP Tunza International Youth/Children's Conference, youth environmental networks in Africa, Asia Pacific, Europe, Latin America, North America and West Asia, the Asia-Pacific Eco-Minds forum, and a photo competition, 'Ecology in Focus', in Eastern Europe.



# EDITORIAL

There is no more important task for any generation than ensuring that everyone on Earth has enough to eat, and that the planet will continue to be able to feed its growing number of people. It is a task at which humanity so far has both succeeded and failed. The good news is that – despite predictions that population growth would outstrip food supplies – the world has continued to produce enough to feed all its inhabitants. The bad news is that there are as many hungry people as ever, because the Earth's bounty is not distributed anything like fairly.

Every day, 18,000 children under the age of five die from hunger or hunger-related diseases. That toll – in a world that produces enough for everybody – is a scandal on the scale of such historic inequities as the slave trade. And it is getting worse as the present world food crisis takes hold, a crisis driven not by food scarcity as a result of poor harvests, but because of growing demands from the relatively prosperous. This situation has to be addressed as an urgent matter of justice. Feeding the hungry must be the absolute priority, and one of the most effective ways of doing it is to provide support to the world's hundreds of millions of poor farmers who are themselves often short of food, and who can be outstandingly productive in the amount of food they harvest from each hectare of land.

More food will have to be produced as human numbers swell, but it must not be done at the expense of the Earth's ability to feed future generations. Failure to observe this simple principle of sustainability has already made our task much harder. Overfishing has exhausted most of the world's fisheries, overgrazing is one of the main causes of increasing desertification, and overcultivation has degraded soils worldwide. And the felling of forests is disrupting rainfall and water supplies and contributing to climate change which, in turn, poses an ever-growing threat to food supplies. It's going to be a big task to reverse all these trends, but – let us say it again – there really is no more important one.

**COOL:** Composting vegetable waste. There are loads of ways of doing it, from a simple pit dug in the garden to household worm composting bins (vermicomposters). Unlike landfill, composting releases no methane, a greenhouse gas 30 times more potent than carbon dioxide.

**COOLER:** Using the compost to grow vegetables and fruit. Compost improves the soil, strengthens roots, speeds plant growth and makes produce more nutritious.

**COOL:** Crockery and cutlery made from bamboo, which is highly renewable, 100 per cent organic and biodegradable! Bamboo is one of Earth's fastest-growing plants and needs no replanting, fertilizers or pesticides.

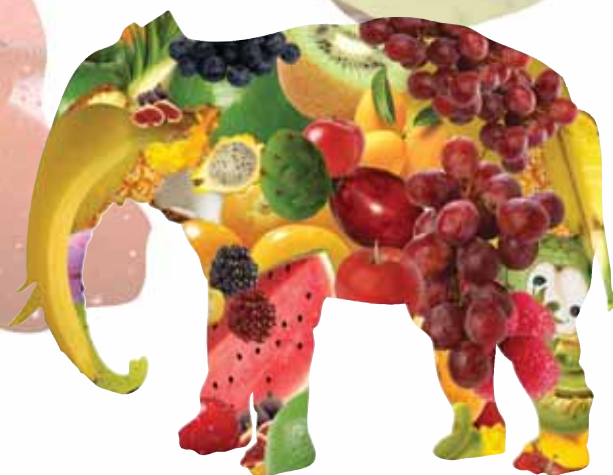
**COOLER:** Banana leaf service – an Indian tradition of serving food on a banana leaf 'thali' plate, which adds not only flavour but medicinal value as well.

**COOLEST:** An edible plate. Injera, a round, 'pancake' of sourdough bread made of an iron-rich grain called teff, is the basis of Ethiopian cuisine. After the injera is cooked, it's served topped with spicy stews and salads. Diners tear off a piece of the injera and use it to pick up bits of food – making it serve as utensil, plate, and meal!

**COOL:** Picking up a basic skill. Learning how to sew, knit, garden, fish, forage, build furniture, or even start a fire are all absorbing ways to increase your sustainable lifestyle.

**COOLER:** Baking bread. As basic skills go, nothing is more satisfying! Soda bread is easy to start with. Mix 450 grams flour, a teaspoon of sugar, a teaspoon of bicarbonate of soda, and a teaspoon of salt. Add 200-300 millilitres of buttermilk, or milk soured with lemon juice, or yogurt. Knead the dough. It should be soft but not sticky. Split into two mounds, cut a cross on top, and bake on parchment paper at 200°C for an hour.

**COOLEST:** Joining the 'transition town' movement. Transition towns – already in existence in Australia, England, Ireland, New Zealand and Wales – aim to redesign local communities so that they work together to be more self-sufficient and sustainable rather than relying on fossil fuels. Wherever possible, goods are grown, produced and consumed within the community. Workshops and training events build knowledge of traditional skills, and barter is encouraged.





# Food in crisis

It's being called the 'silent tsunami'. A world food crisis – unlike anything we have ever experienced before – is rushing towards us. Already millions are facing starvation.



Haitian Children's Home

**All** the signs of impending disaster are there. Food prices have shot up while grain reserves have plunged to record lows. People who were already hungry have even less to eat. And food riots are breaking out around the globe.

At first sight it all seems familiar. Prices have soared like this three times over the past 60 years, sparking worldwide crises. But this time it is different.

All the previous crises have come about as a result of failing harvests. But this one is coming at a time of record production. The previous ones have been quickly resolved when abundant crops resumed. This one looks like going on for a long time, unless there are dramatic changes in policy.

The World Food Programme – which coined the 'silent tsunami' phrase – calls this 'the new face of hunger'. Its Executive Director, Josette Sheeran, explains: 'There is food on the shelves, but people are priced out of the market.' She goes on: 'This crisis threatens not only the hungry, but also peace and stability.'

While previous crises have been caused primarily by reductions in the supply of food, this one – for the first time – has resulted from growth in demand. In part this is fuelled by the world's success in achieving widespread economic growth, which has caused a rapid increase in demand for meat.

Most people like to eat meat when they can afford to do so, and more and more now can. The number of middle-

class people in developing countries is rising by 50 million a year. But soaring meat-eating mops up world food supplies, because livestock consumes so much grain: it takes 8 or 9 kilos of grain, for example, to produce just 1 kilo of beef.

Meanwhile, demand has also been shooting up in rich countries (where people already eat a lot of meat) as the rapid growth in biofuels has led to cars, as well as cows, competing with hungry people. Just one tank of fuel for a large private vehicle uses enough corn to feed a hungry person for a year.

From 2006 to 2007 the expansion of biofuels more than doubled the world's normal increase in demand for grain. Lester Brown, President of the Earth Policy Institute, estimates that by next

## Forgotten heroes

Meet the world's least-sung hero – the small farmer of the developing world. Often ignored by policy makers, he – or more often she, for women usually do the bulk of the work – is the single most important ingredient in any

recipe to tackle hunger. Though among the poorest people on the planet, these small farmers are up to 20 times more productive than big rich ones. They get much more food out of each hectare of ground, partly

because they have no alternative. But given better seed, fertilizer and other support, they could be even more productive. Above all they need security of tenure of their land and help in getting their crops to market. Instead, new technologies and assis-





Biosphoto/Thouvenin Claude/Still Pictures

year biofuels will be using more than a quarter of the US harvest, which traditionally has helped feed more than 100 countries. The price of grain will in future be determined by the fast-rising price of oil, he adds, as the market will cause it to be used for fuel, not food, if it is more profitable to do so.

In truth, the crisis has been brewing for a while now. Even though harvests have generally been quite good, rising demand has meant that the world has not produced as much as it has consumed for seven of the last eight years. We have got by through eating our reserves, with the result that the world's food stocks – our insurance against famine – are now lower than they have ever been. And this – aided by market speculation – has driven prices even higher.

Prices of rice and wheat doubled in a year. This is already putting governments under pressure in the developed world, where the rising cost of grain has relatively little effect on the prices of foods in the shops because so much value has been added in processing. But the effect on the poor in developing countries – who already spend some 80 per cent of their income on food – is devastating.

Already 25 million people in India are thought to have cut down from two meals a day to one, while the calorie intake from an average meal in El Salvador dropped by half in less than two years. Food riots have broken out from Mexico to Mauritania, Indonesia to Yemen.

Robert Zoellick, President of the World Bank, says that the rising prices will undo the past seven years of progress

in fighting poverty. He warns that more than 30 countries are now at risk of social unrest from the crisis, and that at least 100 million people are facing imminent destitution.

The future looks grimmer still. Studies at the University of Minnesota, carried out before the advent of the crisis, reckoned that the number of hungry people in the world would fall from the present 850 million to 625 million by 2025. Now these estimates have been revised, and the hungry are expected to grow to 1.2 billion by then.

And none of this takes into account the effects of climate change, which threatens to disrupt world harvests. If the world is facing such a crisis while production is good, what will it be like when it fails?

tance are usually given to richer farmers, who often use the advantage to push the small ones off their land.

Redirecting attention to these unsung, neglected heroes is vital – they and their families make up a large proportion of the hungry because

they can't produce enough to feed themselves. Helping them tackles hunger directly while at the same time increasing production. And it is usually better for the environment, because they tread more lightly on the planet.



Ron Gilling/Still Pictures

# Q & A

**Q** Many people, particularly in developed countries, have lost any sense of connection with their food, often eating on the run with little sense of ritual or any awareness of the origins of the food. This may contribute to wastefulness and overindulgence. How can they get that sense of connection back?

**A** Our reasons for eating range from hunger, through the craving for a specific dish for its tastes, colours, textures, or nutritional values to, unfortunately, overindulgence. We often forget the millions who do not have access to basic food, nor remember the negative impacts on our health and well-being – and the environment – of consuming junk food.

Food should not be treated as trash. So order or prepare the right amount – and if you can't finish it, pack what is left to take with you, or store it for later use.

Many of us, in this era of consumerism, are also missing out on the important social skills and life-long lessons gained from eating together, with the opportunities it offers to discuss and share ideas and views, and get to know each other better and learn from one another.

**Q** Food prices are rising but a culture of wastefulness persists, especially in developed countries. Recent reports revealed that every day, Britain throws away 220,000 loaves of bread, 1.6 million bananas, 550,000 chickens, 5.1 million potatoes, 660,000 eggs, 1.2 million sausages and 1.3 million yoghurts. Will it take a state of emergency for people to realize the value of the food they eat?

**A** We need to be much more aware, and understand what goes on in the poorest countries of the world and how most of their people struggle minute-by-minute to make it through to tomorrow. It is staggering but true that 2.5 billion people – well over a third of the world population – have to make ends meet on less than \$2 a day, and more than a billion have to try to survive on half of that. The main state of emergency that needs to be declared is in the media, to make this reality well known and help us all act responsibly towards our fellow human beings and the planet.

**Q** We are often encouraged to eat more fish to support a sustainable lifestyle. But can aquaculture and fisheries have a damaging effect on the environment?

**A** Seafood is indeed generally very healthy, but fish stocks are stretched to the limit – and sometimes collapse – as a result of overfishing, pollution and loss of breeding grounds. This has devastated fishing and coastal communities alike. The demand for seafood continues to increase, nevertheless, so there has been a rapid expansion of fish farming in closely

managed environments. This can be carried out responsibly and sustainably, but it can cause damage – such as from pollution by uneaten feed and excrement, high in nitrogen and phosphorous. More needs to be done to minimize the impact of aquaculture on the environment, and to ensure its full sustainability.

**Q** If every member of the human family became a vegetarian, would there be enough food for all? Would it help combat global warming by cutting emissions from livestock?

**A** Being vegetarian is a personal choice based on such things as principle, religious belief, concern for health, or even just taste. At present there is probably enough food to go round, to satisfy all diets, if only it were distributed fairly. Livestock provides livelihoods to more than 1.3 billion people and makes up about 40 per cent of global agricultural output, but this is the fastest-growing sector in agriculture, and contributes significantly to many environmental problems, including climate change and the degradation of land and water. It needs careful management, and an awareness of the need to use water resources sustainably.

**Q** Will producing enough food to feed an ever-growing human population necessarily put an intolerable strain on the planet?

**A** A growing population inevitably puts enormous additional demands on the planet's environment, not just for food but for water, land, shelter, and goods and services. What is most important for our species' survival is a generation of environmentally responsible citizens who can make decisions and choices based on knowledge and understanding of the workings of the natural world, and who want eventually to pass the planet on to the next generation in better shape than they found it.

**Q** What can young people do to live a more sustainable life in terms of the food they eat?

**A** There are lots of things young people from both developed and developing countries can do, including learning more about the food we need, buying and eating local produce, leading the sustainability debate and influencing processes linked to food security and lifestyles, and protecting the natural resources on which we depend.

Young people have a special role in stimulating and mobilizing the maximum level of commitment to sustainability from the bottom up, all the more so at a time of climate change and rising food and energy costs.





## USEFUL WASTE

## CUTTING the carbs

Does your kitchen need to go on a carbon diet? Ovens, fryers and hotplates guzzle fuel. Many traditional cooking methods are kinder to the planet... Check out these low-carbon options from around the world.

**Ceviche:** This South American dish uses citrus juice to pickle fresh seafood – usually white fish – instead of cooking it. The juice's acidity breaks down the fish protein through a process called denaturation. There are hundreds of versions of ceviche, Peru's national dish, but everyone knows their mother's is best.

**Volcanic lava:** As long as you have an active volcano handy (Hawaii is a good bet), cooking with molten lava is pretty simple. Wrap some meat in banana leaves, place a shovelful of molten lava on the ground, and carefully place the meat in the centre of it. Pop a second blob of lava on top of the meat, leaving a small opening to avoid steam explosions. Wait 45 minutes. Break the now not-molten lava open with the shovel. Serve hot!

**Biltong:** In South Africa, lean cuts of venison, beef – and even ostrich – are doused with vinegar, mixed with seasonings, and dried in the sun until they get nice and tough. The result makes a high-energy chewy snack, but also shows up as pizza topping, in salads and in pasta sauce.

**Hay box:** Back in wartime 1940s, when fuel was short, the United Kingdom reached for boxes filled with hay, shredded newspaper or straw, and put pots of half cooked stew in them. The insulation trapped the heat in the stew, letting it continue to cook itself, slowly.

**Hangi oven:** Throughout the South Pacific these stone-lined pits (also known as *umus*) are heated with fire. When the stones are hot enough, the fire is extinguished and the food – often an entire pig and lots of veg – is wrapped in leaves and placed in the pit. More rocks are layered on top and the whole thing is covered with earth to prevent heat escaping. In two hours it's all dug up and it's time to feast.

Alex Lin tells TUNZA about putting his computer enthusiasm to work for the planet, starting when he was just 11.

People replace their electronic gadgets frequently, but what happens to the old ones? Some people put them out of sight and forget them, or give them away. Most often, though, old computers or cell-phones end up as e-waste. About 97 per cent are burned, dumped or exported – exposing people to poisons like cadmium, lead and mercury, which can cause brain damage and cancer.

I first heard about this in 2005, and wondered if it was a problem in my hometown of Westerly, Rhode Island, United States of America. My friends and I at Westerly Innovations Network – a student volunteer organization that we set up ourselves – investigated and were horrified to find that more than 4 million computers, televisions and monitors would be discarded by 2011 in our small state alone – and that there was no regulation against dumping e-waste.

So, we first found local recyclers that had signed a stewardship pledge to recycle e-waste without damaging the environment. Then we started a recycling drive that collected nearly 10 tonnes of e-waste, and installed a permanent collection receptacle at our local dump. This keeps an average of around 2.5 tonnes of e-waste out of landfill every month: so far, we've recycled 90 tonnes of it.

We also discovered, with the help of a local company, that refurbishing is realistic, not so difficult, and seven times more efficient than recycling. So far, we've managed to replace the hard drives and RAM on 350 computers, adding cool software, and given them to local students who don't have one of their own.

While action like ours helps, it's not enough. Recycling e-waste should be mandatory, global and sustainable. So as part of our project, we testified to the State Environment Committee, helping to enact a law that forbids the improper disposal of e-waste in Rhode Island.

But the story doesn't end there. The best bit of all is reaching out to kids around the world. We've sent refurbished computers to young people in Sri Lanka affected by the 2004 tsunami, and are getting similar recycling and refurbishing projects going in both Mexico and Cameroon – for a start.

Our message is: if you want to get involved in community service, just find a cause, and really believe that what you're doing is right!

# Feeding the world

**TUNZA asked three agricultural experts about the future of the world's agriculture and the prospects of feeding a population that is expected to increase to 9 billion by 2050.**



Ron Giling/Still Pictures

**'F**ood, whether cultivated as is done by humans and termites, or foraged for as is done by bees, has always been, and will always be, the limiting factor in population growth,' says Dr Tewolde Berhan Gebre Egziabher, Director General of the Environmental Protection Authority of Ethiopia.

'Just as increased foraging can temporarily augment the food supply of a bee colony, so an increased tapping of the biosphere through the temporarily feasible maximization of cultivated land and intensification of farming can temporarily increase agricultural production. There is still more land that could be cultivated, especially in Africa and South America, so there is some technological leeway for intensification. But, in the final analysis, the carrying capacity of the biosphere is limited, and we have to curb the human population to stay within that capacity. The alternative is chaos.'

'Nonetheless, we can feed everyone alive on Earth and even accommodate some population growth, especially in underpopulated parts of Africa. But so long as we continue to accept a world of unjust wealth distribution, there will always be some who eat more than they need, and get sick, and many others that suffer in hunger.'

'The intensification of agriculture,' continues Dr Egziabher, a UNEP Champion of the Earth, 'has mostly depended on inputs derived from petroleum, but the price of petroleum is rising steeply. There are some attempts to produce petroleum substitutes – biofuels – from agriculture. But the use of agriculture to produce biofuels obviously makes less food available for humans, especially for the poor. And, clearly, it doesn't make sense to intensify agriculture through the use of biofuels merely to produce biofuels!'

Dr Egziabher believes that humanity must work with nature through recycling nutrients to grow crops. 'This is the essence of organic agriculture, which fed humanity until the intrusion of industrial agriculture about 70 years ago, and which must, whether we wish it or not, continue to feed humanity into the indefinite future. This is because industrial agriculture is becoming increasingly expensive and untenable in this age of climate change.'

'We humans will always need food, but most of what we eat can be produced locally,' he adds. 'To do this, we must minimize our consumption of animal products when those animals compete with us for food crops. If we eat the crops directly, they amount to nine times or more than the body weight of the animals. It is only when the animals feed on plants that we do not eat or on crop residues that we cannot eat that they constitute a net addition to our food.'

'Agribusiness will, of course, keep making money during the necessary change in agricultural systems. The companies that focus on the fine-tuning of natural nutrient cycling to increase productivity will stay in business; those that remain stuck in industrial agriculture will become obsolete,' continues Dr Egziabher.

'The era of the replacement of ecological niches by extensive, artificially maintained, homogenous farm environments, growing single crop varieties, is ending because agrochemicals are becoming expensive and irrigation water scarce. A major devolution of the responsibility for agricultural innovation back to the farmer on the land is inescapable. Consequently, educating farmers on the land to equip them with scientific capacity is a renewing mandate of educational systems.'



**T**he benefits of productivity increases in world agriculture are unevenly spread. Often the poorest of the poor have gained little or nothing, and 850 million people are still hungry or malnourished, with an additional 4 million now joining their ranks annually. Business as usual would mean more environmental degradation and the Earth's "haves" and "have-nots" splitting further apart. It would leave us facing a world nobody would want to inhabit.'

Professor Robert Watson, Director, International Assessment of Agricultural Science and Technology for Development



Xu Yi Min/UNEP/Topham



Golden Rice Humanitarian Board/www.goldenrice.org



Sean Sprague/Still Pictures

**F**eeding everyone on Earth must be the world's top priority', says Dr Friedrich Berschauer. 'And not just for today. We are all responsible for ensuring there will be enough food for all the world's people 50 years from now.'

As Chairman of the world's largest agri-chemicals company, Bayer CropScience, Dr Berschauer feels that responsibility more than most, and the challenge is indeed formidable.

Back in 1950, United Nations statistics show that the 2.5 billion people then alive were fed from 1.3 billion hectares of arable and permanent croplands – that's about half a hectare per person. Since then, the population has more than doubled, to 6.1 billion, while the amount of agricultural land has increased by just 15 per cent. And space will become scarcer still. 'Forecasts suggest that by 2050 there will be more than 9 billion of us,' Dr Berschauer told TUNZA, 'but we are already using almost all the viable productive land. The challenge facing us all is how to increase productivity, substantially and sustainably.'

'It isn't just extra people,' he adds 'but as people become more affluent, so their demand for food, particularly meat, increases. We have seen this in recent years in India and China.' And there is the competing interest in biofuels, for which demand is expected to rise from today's 40 billion litres to 95 billion by 2015 – and to go on rising. The added demand has put up prices. But Dr Berschauer repeats: 'Feeding the world must remain humanity's top priority.'

'We have had nearly 40 years of falling food prices,' he adds. 'In real terms, these have gone down 75 per cent since 1970. However, in April 2008, prices for rice, wheat and corn reached record highs. While these have retracted somewhat since then, I fully expect agricultural prices to remain on a high level in the coming years. This will be particularly hard on emerging economies and developing countries, but I

believe these rises are best cushioned by aid to those who need it most. Export restrictions just further limit supply, and make matters worse.'

'Trade really helps the hungry. Markets free of subsidies and restrictions encourage the cultivation of crops in countries where the natural conditions are most suited to efficient and optimal production. And for this we need heavy international investment in agricultural research, technology and infrastructure to produce the advances in production necessary to feed an increasing population and reduce the number of food-insecure people in the world.'

There's some hope from the past. Remarkably, the number of food-insecure people has hardly grown between 1950 and now, despite the halving of cropland per person. The secret is increasing the yields on each hectare.

'We need a holistic approach that uses both traditional crop-rotation and irrigation, but also encourages the development of new crop-protection techniques and seeds with higher yields,' says Dr Berschauer. 'Between 30 and 40 per cent of today's global harvests would be lost without such scientifically developed crop-protection systems, and with the advent of climate change, the need for them will certainly increase.'

He also believes in the value of biotechnology, which the Consultative Group on International Agricultural Research says could help further increase yields by as much as 25 per cent. He concludes: 'Of course small-scale production and organic farming are important, but alone, these cannot overcome the worldwide challenges facing farmers. Humanity shouldn't turn its back on the opportunities that genetic engineering offers, whether in medicine or agriculture. To increase production as rapidly as we must, we need a new and sustainable green revolution, and biotechnology can provide some of the necessary tools.'

# I'm going back for my future

By Claire Hastings

IT STARTS as I walk through the sliding doors. A booming voice greets me, 'Attention shoppers, there is a two-for-one special offer on probiotic yoghurt in aisle four.' My eyes flick up to the banner above a pyramid of cans. 'Can O'stew contains 120 per cent of your daily protein! Low in fat!' I reach for some apple juice: the container proudly assures me it 'contains 10 per cent real fruit juices'. As I meander through my local grocery store I read the labels. 'Excellent source of vitamin C.' 'High in Omega-3 fatty acids.' 'Trans-fat free!' Stranded among giant refrigerators, I start to wonder when we forgot about *food*.

People think a lot about eating – and we also think a lot about what we eat. But somehow, we've made food too complicated. I'm pretty sure that if I took my grandmother along on my

Free-range, grass-fed cattle are not as fat than their industrial, corn-fed brethren. Their meat has more conjugated linoleic acid, which fights against cancer, and lots of vitamin E, which lowers the risk of heart disease. Carrots and potatoes from the weekly farmer's market may be smaller than those you find in a grocery store, but they taste better and have more caloric energy per gram. Eating locally is green, too. It means that less carbon dioxide is emitted transporting the food, and, if it's organic, fewer chemicals are released into the environment.

But what do you do if you happen to live in a challenging environment where food can be seasonally scarce? You look to your grandmother. Mine lived in a region blanketed in snow for



Velachery Balu (Chennai)



Paula Niziolek

weekly shopping trip, she wouldn't recognize most of what is in the store. Back in her day, vegetables came from the garden, meat from the butcher or the farm down the road, and she baked bread herself. Refrigeration and overnight shipping allow the vegetables in my Toronto grocery store to hail from Chile, Mexico and Spain. The sushi restaurant down the street flies fish in fresh from Japan. And I don't really eat bread anymore: I take vitamin and fibre supplements instead. And while it's nice to be able to eat oranges in the cold Canadian winter, all this technological progress has created a barrier between eaters and what's being eaten.

Michael Pollan agrees. The author of *In Defence of Food* points out that – particularly, but not exclusively, in industrialized countries – people subsist on 'edible food-like substances', products of laboratories rather than nature. His prescription is: 'Eat food, not too much, mostly plants.' I think he and my grandmother would get along. Both would certainly remind me that locally available, fresh food is healthier than pre-packaged alternatives.

half the year. Every weekend in September she bottled enough fruit and vegetables to last her family through the long winter: before there were refrigerators there were cupboards and cellars filled with preserved food.

In the same way, grandmothers in Eastern Europe and Korea have been pickling cabbage into sauerkraut and *kimchi* for centuries, and throughout West Africa and the Caribbean region salted cod has long been a staple. Many of these preservation techniques, like dehydrating fruit or meat, were used before the Industrial Revolution and their production is carbon-free.

I'm probably not going to give up on my grocery store completely. My attempts to grow oranges have not been too successful, and I don't know how to make cheese. But I'll pay attention to where my food comes from, and I'll eat a balance of plants, cereals and protein (with the odd sweet for fun). So, thanks to Michael Pollan, I'll be eating more food that my grandmother would recognize.



Kim Jackson DeBord





# Organic dilemma

By Maurice Odera

It's healthy and it's chemical-free, but Kenya's growing organic agriculture is being endangered by the very people who promote it in their own countries. Some environmentalists in the European Union (EU) are pressing for it to be classed as unfriendly to the environment because of the distance it has travelled from Africa, but without making a true assessment of its real impact on the planet.

Anything that happens to our agriculture in Kenya affects the whole of the country. Around three quarters of our people work in farming, and more than half of all export earnings and a quarter of GDP come from agricultural products like tea, coffee, tobacco, palm oil, cashew nuts, sisal and pyrethrum. Half our output comes from subsistence farming, but our exports of fresh fruits and vegetables are attracting increasing attention and investment from overseas.

Organic farming, too, has grown, and now accounts for around 5 per cent of our agriculture, following the guiding principle: 'to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings'. There is no real market for organic produce at home, so chemical-free vegetables, fruit, coffee, tea, beans and nuts – mainly macadamias, cashews and sheas – are exported, particularly to Europe and Japan.

But now, progress in organic production is being threatened by pressure from the EU – where consumers are concerned about food miles – to disqualify produce from being designated as 'organic' because transporting it contributes to climate change. This could cause Kenyan organic produce to be labelled environmentally unfriendly, and lead to farmers losing the markets they have worked so hard to build.

And transport is only part of the story. As our farmers point out, when the way the food is produced, and how much energy is used in the process, is taken into account, Kenyan produce still has a lower carbon footprint than much European produce – even when shipping is included in the equation.

One recent study showed that so much energy is used to heat greenhouses that tomatoes grown under glass in the United Kingdom actually had a bigger carbon footprint than tomatoes transported there from Spain. Similarly, far less energy-intensive fertilizer is applied in Kenya than in Europe.

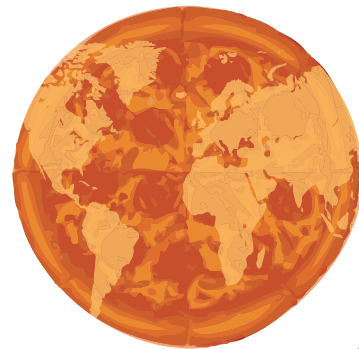
The argument may seem obscure, but it is very serious to Kenya and other developing countries, whose farmers depend so much on exports. It seems to be one example, among many, of how environmental issues need to be addressed in the round, without too much emphasis on single issues in isolation.

Photo: Maria Galvan



# Pizza EARTH

## The world on a plate



### Wheat

Humanity's oldest crop was cultivated in the Fertile Crescent of Southeast Asia as much as 10,000 years ago. It is now a staple food for about a third of the world. Wholegrain bread is very nutritious, and the hard red wheat commonly used for making bread flour is high in protein, fibre and iron.

**Major producers: China, India, United States of America, Russia, France**



### Tomatoes

They come from the Andes, but may first have been domesticated in Mexico, where the Spanish explorer Cortez came across them in Aztec gardens. He brought them home to Europe, where people enjoyed looking at the colourful fruits but were afraid to eat them. Like potatoes, they belong to the same family as poisonous deadly nightshade, but are notably healthy foods – even containing lycopene, a chemical that lowers the risk of contracting cancer.

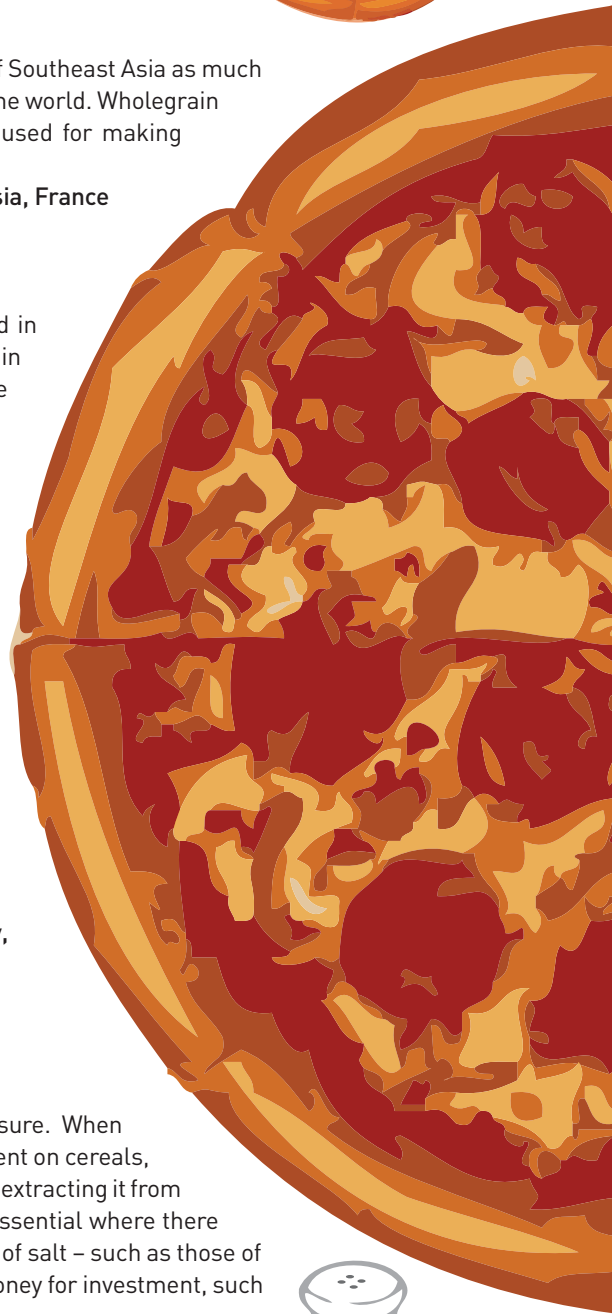
**Top producers: China, United States of America, Turkey, Italy, India**



### Basil

Central to Mediterranean and Southeast Asian cuisines, basil – with varieties ranging from vibrant green to dark purple – has long been revered. In Greece, the word basil means 'king'. In India, the herb is planted in monastery and temple gardens. Some say it originated in India, others Africa, but it was recorded as growing in China's Hunan region more than 1,000 years ago. Easily grown in warm climates, it is used as a natural remedy for digestive complaints.

**Top producers: many countries, including France, Egypt, Hungary, Indonesia, Morocco, United States of America, Greece, Israel**



### Did you know?



Turkey's dried oregano exports doubled to about 7,000 tonnes annually in the last decade, enough to flavour a slice of pizza for each person on the planet!

Americans eat approximately 40 hectares of pizza each day, or about 350 slices per second.

In Iceland, vegetables for pizza toppings are grown in greenhouses heated by geothermal energy.

### Salt

Salt regulates fluid balance and blood pressure. When humans stopped hunting and became dependent on cereals, they started evaporating salt from seawater or extracting it from rocks. It also preserves food well, making it essential where there is no refrigeration. Civilizations with a surplus of salt – such as those of ancient China and Rome – traded it to raise money for investment, such as for infrastructure or in times of war.

**Top producers: United States of America, China**



### Oregano

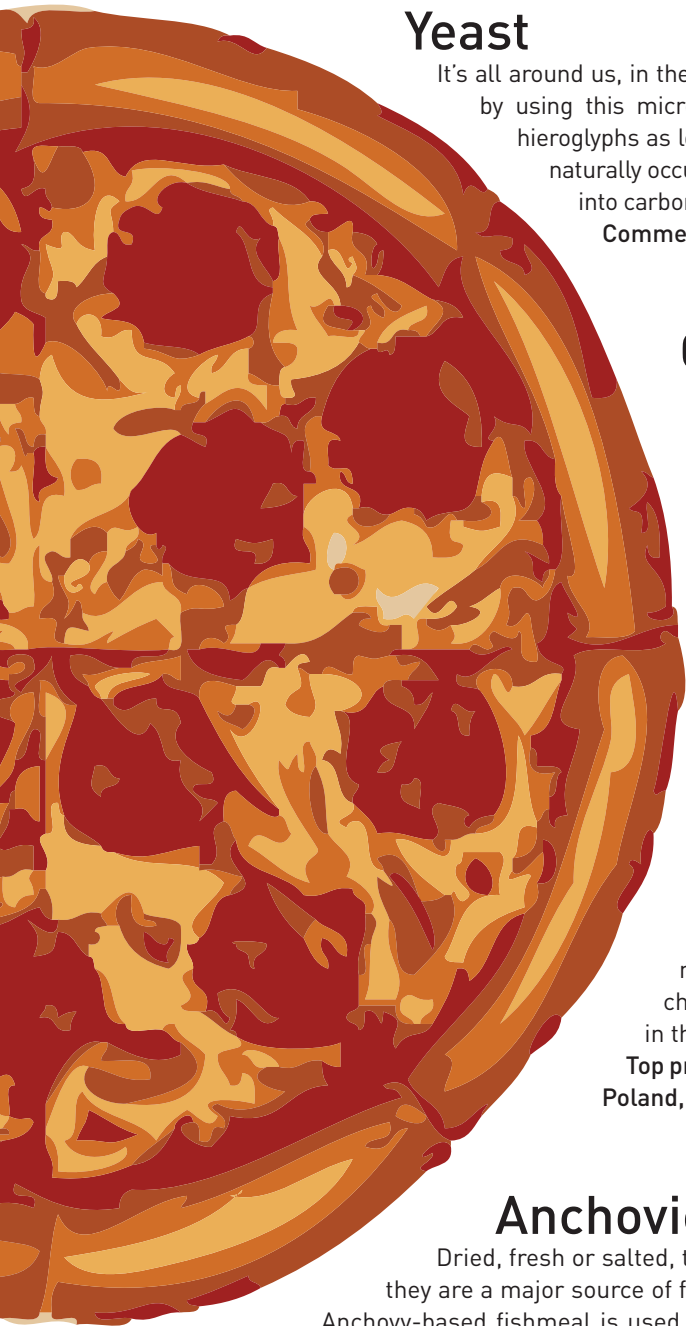
In Greek mythology, the goddess Aphrodite gave humans the 'joy of the mountains' to sweeten their lives. It flourishes in hills around the Mediterranean, and most of what is exported around the world is gathered wild in Turkey. It's easy to cultivate, but is thought to taste better wild. It's nutritious, too, containing iron, calcium, vitamins C and A and Omega-3 fatty acids.

**Top producers: Turkey, Greece**



**What do you have on yours? India:** pickled ginger, minced mutton and paneer. **Japan:** squid and mayo jaga (mayonnaise, potato and bacon).

What could seem more of the moment than a pizza – the most popular fast food of them all? But eating such flatbread has been common for millennia: the Romans used to dress theirs with olive oil, herbs and honey. Even after the process of leavening bread was discovered, such semi-leavened breads remained popular as they are quick to prepare and need less fuel to bake. The pizza itself originated in Naples in 1889, when Raffaele Esposito invented a pie covered in mozzarella, basil and tomatoes – the colours of the Italian flag – in honour of the visiting Queen Margherita of Savoy. Since then the dish has migrated to every corner of the world, and it gets its ingredients from all over the globe too.



## Yeast

It's all around us, in the soil and the air. No one knows who first thought of making bread lighter by using this microscopic, single-celled fungus, but the practice is recorded in Egyptian hieroglyphs as long as 5,000 years ago. Perhaps a flatbread mixture was left too long and naturally occurring yeasts began fermenting. At any rate, they work by converting sugars into carbon dioxide, which breaks down the flour's starches and makes dough rise.

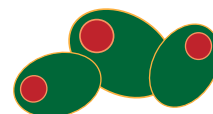
**Commercially produced worldwide**



## Olives

One of the world's oldest known cultivated trees, the olive has been highly valued for its fruit, oil and wood for 6,000 years. Mohammed advised his followers to eat and anoint themselves with olive oil. Originating in West Asia – where modern olives' wild ancestors still live – it spread to Southern Europe and Africa. Spanish missionaries took the plant to California to supply themselves with food and holy oil.

**Top producers: Italy, Spain, Greece, Turkey, Tunisia, Syrian Arab Republic**



## Cheese

Mozzarella's origins remain a mystery, but one legend suggests it was discovered when cheese curds accidentally fell into a basin of hot water. Even now it is made by stretching the warmed curds and forming them into soft, elastic spheres. Cheese itself is thought to have originated in West Asia, perhaps when milk in a pouch made from an animal's stomach – which would have contained rennet, the enzyme needed for curdling – separated into curds and whey in the heat. Making cheese was an important way of using, and effectively storing, surplus milk in the absence of refrigeration.

**Top producers: United States of America, Germany, France, Italy, Netherlands, Poland, Brazil, Egypt, Argentina, Australia**



## Anchovies

Dried, fresh or salted, there is more to these little fish than first appears. Consuming plankton, they are a major source of food for all predatory fish and for seabirds, who produce valuable guano. Anchovy-based fishmeal is used as an organic fertilizer and feed for livestock. The fish are plentiful in temperate waters around the globe – featuring prominently in Korean, Japanese and Thai cooking – but are sensitive to warming waters as the climate changes.

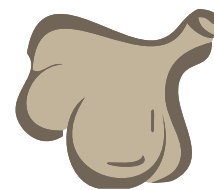
**Other top producers: Peru, Chile, Spain, Portugal, France; Morocco is the world's top anchovy canner**



## Garlic

No one is neutral about this pungent bulb from Central Asia: it has inspired both devotion and disdain for at least six millennia. Ancient Egyptians considered it sacred, while ancient Indian upper classes found it too smelly to eat. It's mentioned in the ancient texts of Sumer, Greece, China and India and has long been recognized for its medicinal properties, including protection against colds, cardiovascular disease and cancer. Sadly, no one has been able to prove that it works against vampires!

**Top producers: China, India, Republic of Korea, United States of America, Russia**



se, potato and bacon), eel, shredded seaweed, teriyaki chicken, curry. **England:** sweetcorn and tuna. **Saudi Arabia:** beef. **Netherlands:** grilled lamb. **Korea:** sweet potato, pumpkin,

sliced almonds, mayonnaise, broccoli. **Brazil:** green peas, guava jam, bananas. **Russia:** mockba, a combination of sardines, tuna,



# In the blood

**Mory Kanté, musician and food campaigner, talks to Alpha Bacar Barry**

'MY SONGS ARE ABOUT TODAY AND TOMORROW, BRAVERY AND LOVE, IN FACT LIFE ITSELF,' says Mory Kanté, an artist in a great African tradition. A griot – one of the musician-poet-diplomats often considered to be guardians of West Africa's oral history – he became well known worldwide when his song, *Yéké Yéké*, became an international Number 1, and even more so when it was remixed for the soundtrack of the Leonardo DiCaprio blockbuster, *The Beach*. And now he has another international role as a Goodwill Ambassador of the Food and Agriculture Organization of the United Nations (FAO).

'When your finger hurts, your entire body feels the pain,' he says. 'So, too, with the human family. We must feel solidarity for one another, and remember that a hungry man is not a free one. Food must be available to everyone. We must all unite and work flat out to achieve this, even if it means that some of us have to give up a little.'

From an early age, Kanté was initiated into the responsibilities of the griot tradition by his grandfather. He mastered many instruments including the lute-like kore and the balafon, a type of xylophone, and learned the history of the Mandingoes, the peoples of his native Guinea as well as Guinea-Bissau, the Gambia, Senegal and Mali. 'A griot is defined by *djeli*, meaning blood, the element that irrigates our bodies and knows them best,' he explains. 'In the same way, the griot is in touch with his people. That's why, as well as entertaining, griots have been used to interpret treaties and agreements between different communities, and even acted as counsellors to kings.'

It's much the same in his work for FAO. 'To be human one must develop an empathy with one's fellows,' he says. 'I see my ambassadorial role as telling people about the realities of poverty and hunger. The whole world needs to mobilize to solve these twin scourges.' He has carried this message, through his music, from Africa to North America, from the World Food Day festivities broadcast in 188 countries to the Vatican celebrations for Pope John-Paul II's jubilee.

'Of course I am an artist,' he adds, 'but artists, particularly, speak out when people seem unable to solve the problems that they, themselves, have created. Take the rush for biofuels: can it be right to look for energy from our fields, when so many still go hungry? Feeding ourselves must always be the priority. We talk of democracy, and in Africa we may be politically independent, but we do not have economic independence.'

'The first thing I believe we must do is remove all taxes and subsidies from food as the combination of poverty and hunger is explosive. It is also a question of organization and training. In Africa, for example, we have the land and potential for irrigation. We must develop the way we use our agricultural land, including our pastures.'

Now in his 50s, after more than 30 years at the top of his profession, Mory Kanté is keen to help mobilize the exceptional energy of the young to bring about sustainable development. 'Today's youth are the future of this world and they should not inherit the problems that hunger and poverty bring,' he says, urging young people to 'go back to the land and work to ensure the best possible use of that most precious resource, our soils'.



# How does your garden grow?

'How we eat determines, to a considerable extent, how the world is used. People who know the garden in which their vegetables have grown and know that the garden is healthy will remember the beauty of the growing plants, perhaps in the dewy first light of morning when gardens are at their best. Such a memory involves itself with the food and is one of the pleasures of eating.' Wendell Berry, organic farmer and author

'OUR SMALL GARDEN in the city is a valiant pollution fighter. We grow fruits, vegetables, herbs, trees and shrubs like guava, neem, basil, henna and more. The walls are alive with creepers like betel, passion fruit, and wild bitter gourd. Through *vrikshayurveda* – an ancient system of medicine – we use the plants we grow not just to eat but as medicine. Basil, for example, is used to treat colds and coughs.

We practise integrated pest management by mulching with neem, which prevents fungal disease in our plants. Snakes, birds and worms are friends, but we leave out papaya to keep away rats. We've built a small circular stone wall with drainage holes for vermicomposting. To the worms and kitchen and plant waste we add leaves of pongamia, neem, nirgundi and other plants – as well as a home-made solution that increases friendly bacteria. This creates an organic compost that helps keep our plants pest-free.

Our garden even adds to the community at large. We take cuttings and plant them in orphanages and public gardens. I am content to believe that we're adding our organic drop to the global green reserves.'

**Ruchi Jain, India**

'GROWING VEGETABLES and raising chickens in the middle of the capital city while working full-time as an arts lecturer – it might sound weird, but it's exactly what my mother is doing. We now have eggs and a variety of vegetables for meals, and are proud of their freshness.

My mother grows vegetables in large pots originally made for growing flowers, and made a warm home for our hens by putting up a palisade around a corner of our roof, with rice straw inside so that they feel they are living in nature.

How does she manage it? She just waters the vegetables and feeds a handful of rice to each hen every morning before work, and does the same each evening. As a result, we have enough food even to share with neighbours. And, after tasting this fresh, clean food, our neighbours have begun demanding that the sellers in the market provide it too!

**Ngo Chi Le, Vietnam**

'IN MY GARDEN in the suburbs of Görlitz, Germany, we grow apples, pears, sweet and sour cherries, potatoes, strawberries, chives and parsley. We make jam, jelly and purée from the fruit. We also take our apples and pears to a factory in the city where they make juice from it and sell it back to us at a reduced rate. I like to know where the food I eat comes from; having it nearby is also really convenient and it brings our garden to life. I enjoy cooking and I appreciate fresh, quality ingredients which I can source from my very own garden!'

**Matthias Schmidt, Germany**

'WE GROW A LOT OF FRUIT and herbs here in my family home in Bengaluru, India. We have two coconut trees, very common and popular in India. We also grow papaya, neem, drumstick and mango trees as well as passion fruit creepers. We often dry the mango and use it in pickle, and the drumstick – a drought-tolerant tree with edible



Amanda Goode

**'I always try to eat at least one thing from my garden each day.'**

Liza Malm, pioneer for school gardens

leaves, flowers, pods and roots – is used with lentils in dishes such as sambar. Indian cooking abounds with herbs and spices, so it makes sense for us to grow them ourselves: coriander, mint and curry leaves, which we pluck from the garden as we cook. It is like having a cupboard of treats that naturally replenishes itself! It is also important that we know all of our ingredients are organic, and this helps us to live as sustainably as we can.'

**Dorothy Joseph, India**

'MY FATHER came from a farming background, so although I grew up in the city of Cordoba, he was always keen that we cultivated as much as we could. We kept chickens and grew fig, tangerine, orange, cherry and peach trees as well as lettuce, rocket, carrots, potatoes and parsley. Some people in rural areas of Argentina live sustainable lives without ever knowing what the word means – they simply live off the land, make compost, and waste very little. I love growing our own food because it really does give me a sense of connection with the natural world around me: I give to the earth and the earth gives to me.'

**Sofía Russo Munné, Argentina**

**'Preparing food for others, especially something you have grown yourself, is an act of love.'**

Antonio Carluccio, internationally renowned chef



Akinsey Photography

# The acid test

Professor Nick Owens tells TUNZA of an enormous, but until recently unrecognized, challenge to the Earth and its food supplies.

They call it the 'other CO<sub>2</sub> problem' – and it is something that the dwindling, but noisy, band of climate sceptics never talk about. For it is already, incontrovertibly, changing most of the face of the planet – and provides the clinching argument that humanity must urgently and drastically cut emissions of carbon dioxide.

Besides being the main cause of the heating of the planet, the gas is turning seawater acid, bringing about the most profound change in ocean chemistry in more than 20 million years. Scientists are warning that this acidification of the oceans – which cover three quarters of the planet and on which a billion people depend for protein – could have even more immediate and devastating consequences than global warming.

And yet, as Professor Nick Owens – one of the world's leading marine scientists – points out, they took a long time to spot what was taking place. He says it is 'amazing that the scientific community didn't see this runaway train coming for so long'.

He goes on: 'We've spent our time talking about CO<sub>2</sub> in the atmosphere, about climate change and how it might affect Earth's ecosystems in the future. Yet until a few years ago, we weren't aware of this very profound change already happening in the oceans.'

Scientists have long known that the seas – which, within their three dimensions, provide 99 per cent of the planet's potential living space – absorb the gas as part of nature's way of keeping its levels in balance. They have also mostly welcomed the process as a way of slowing down climate change. The oceans have taken up more than a third of all the CO<sub>2</sub> emitted by humanity since the Industrial Revolution. If it had remained in the atmosphere instead, global warming might well already have accelerated out of control.

But, in protecting the planet, the seas have been sacrificing themselves. And unlike the processes of climate change, many of which are complex and difficult to measure, ocean acidification is straightforward, and its effects are easily measurable. In the words of Professor Owens – who first came to love the sea as a boy living near the beach in northwest England, and has for the past year been the Director of the British Antarctic Survey – 'It's dead simple.'

'Basically, if you've got more CO<sub>2</sub> in the atmosphere than in the water, it just dissolves,' he explains. The oceans are naturally slightly alkaline, at about 8.3 on the pH scale, where 0-7 on the scale is acidic, and 7-14 is alkaline. 'When you put CO<sub>2</sub> in seawater, you reduce that alkalinity, bringing it nearer to becoming an acid.'

The amount of CO<sub>2</sub> absorbed by the world's seas since the Industrial Revolution, he says, has already shifted seawater's pH by 0.1 of a unit. 'That may sound small, but it actually means a 30 per cent change in a very short period.'

This is bad news for creatures like plankton and corals that have hard skeletons made with calcium carbonate, which is very sensitive to pH balance. 'If pH changes even by a small amount, the balance of carbonate ions in the water shifts quite significantly. Then organisms must work harder – they almost have to push uphill to build their skeletons and their shells.'

Part of the problem is that the change is happening so quickly. 'Over geological timescales – millions of years – these organisms could cope,' says Professor Owens. 'But we're already nearly outside the pH range we've experienced in the last 25 million years.'

'When things change very quickly, we know what happens: the last time a spike in atmospheric carbon occurred, 55 million years ago, it acidified the oceans and 90 per cent of the known marine species disappeared. And if plankton and corals were to disappear, it would have a dramatic knock-on effect on our food supply.'

Plankton form the very foundation of the food chain; nearly all marine life





Biosphoto/Eichaker Xavier/Still Pictures

# Seafood with a difference

**There's nothing fishy about it. Besides the dwindling harvests of the nets, there is other food in the sea.**

Countless varieties of seaweed have been eaten for centuries. *Porphyra* – known in Asia as nori and in Ireland, Scotland and Wales as laver or sloke – is the most widely consumed. In China and Japan it is roasted and flavoured for cooking and sushi. In Wales it is washed and boiled, often for up to five hours, to form a purée, which is mixed with oatmeal and fried to make laver bread. Korengo, another edible seaweed, is traditionally eaten either raw, or dried as seasoning, by the Maori people.

Spherical, prickly sea urchins are often eaten raw on sticky rice with sauce and lemon juice, or are sautéed, or cooked in risotto or pasta. They are hermaphrodites, and their gonads are a delicacy in France, Spain, Portugal, Italy and Japan.

Several varieties of jellyfish are also edible; one of the commonest is perhaps appropriately known as Asian cabbagehead (*Rhopilema esculenta*). Dried and salted slices of the creature's dome are soaked in water overnight, blanched, rolled up tightly and sliced into rubbery, crunchy strands. These are high in collagen protein – meant to promote youthful skin – low in fat, and, according to Asian tradition, good for bronchitis, high blood pressure and a variety of other ailments. At any rate, jellyfish have been eaten in China for more than a thousand years.

depends on them. And plankton help regulate the Earth's temperature by directly absorbing CO<sub>2</sub> and locking it away. But there is evidence that these organisms are already being affected in the Southern Ocean – one of Professor Owens' areas of expertise – where cold water restricts the carbonate available. Researchers found that the shells of present-day planktonic marine snails called pteropods are much softer than those of their fossilized counterparts in the mud of the sea floor. And as acid levels rise, their shells begin to dissolve.

He adds that he is 'reasonably certain' that corals – home to more than a quarter of the world's marine fish species – are also starting to suffer. 'Scientists working in the Red Sea reckon that coral growth has been reduced by about 30 per cent, which matches the change in pH that we've seen.'

But it's not always easy to disentangle the effects of acidification from those of other interdependent threats. 'Corals are under threat from warming, from human exploitation, tourism, sediments from deforestation and so on. It's all happening at the same time.'

'Another example is cod: in the last half-century we've seen significant shifts in plankton around the United Kingdom. It could be warming water, acidification, or both. Meanwhile, cod have also become very rare around the United Kingdom,

and people usually blame overfishing. So just for that one food source, we've got three possible impacts. Which is the main one? We can't tell.'

But major change is certainly under way. Even if all CO<sub>2</sub> emissions stopped tomorrow, acidification would continue for thousands of years before seawater regained its normal balance. 'There's a built-in momentum there. We can predict how the pH is going to change with pretty good certainty over the next century or so. And if we carry on at the rate we're going, there will undoubtedly be huge changes in the acidity of the ocean in 100 to 400 years time,' says Professor Owens.

So what's to be done? Professor Owens places most faith in technological change. Developing techniques to remove CO<sub>2</sub> as it is emitted from burning coal would 'make a massive difference' if put into effect over the next 'five to ten years or so'. He wants industrialized nations to use nuclear power to produce hydrogen to run cars and lorries, and to pursue nuclear fusion. And, he adds, 'the greener lifestyle choices we all make help add up to a big difference, too.'

'The outlook is scary, but I have great optimism about the ingenuity of the human race,' he concludes. 'But the time frame is *now*. There's no doubt about that.'

Dean Jamiak



# Eat less

# meat?



Law Keven/Flickr

**MEAT EATING** has never been so popular – and never so controversial. A carnivorous boom has helped to double the price of grain, driving millions into hunger, and spurred a livestock revolution that is adding to global warming.

People, understandably, like to eat meat if they can afford it, and one of the first signs that a nation is climbing out of poverty is an increase in consumption. Most recently it has been a dietary manifestation of rapid economic growth in China and India.

In China, the amount of meat eaten per person has more than doubled in less than three decades, from 24 kilos a year in 1980 to 54 kilos in 2007. In India the rise in chicken consumption has been more dramatic still, soaring more than 11-fold from just 0.2 million tonnes in 1990 to around 2.3 million tonnes today. And consumption in both countries is expected to go on growing.

The problem is that rearing livestock uses a lot of grain that could otherwise directly feed people. It takes 8 or 9 kilos of grain to produce 1 kilo of beef, for example. Similarly, it takes around 20 square metres of land to produce each kilo of beef while only 0.3 square metres can produce the same amount of vegetables. As the world's two most populous nations increasingly turn to meat, the strain is showing on world food supplies.

The 'livestock revolution', as it is coming to be called, is also contributing to global warming. The Food and Agriculture

Organization of the United Nations reports that fully one fifth of all greenhouse gas emissions comes from raising animals for food – more than from all the world's transport.

Ranching is 'the major driver of deforestation' worldwide, it adds, while overgrazing is turning a fifth of all pastures and rangeland into desert. And it takes a mind-blowing 990 litres of water to produce just 1 litre of milk.

But humans are omnivorous for a reason. Meat is a convenient way of getting many essential nutrients. For example, iron, which is particularly found in liver, is needed for forming haemoglobin and myoglobin – both vital in distributing oxygen around the body – and is thought to be difficult to absorb from plant sources. Similarly, vitamin B12, necessary for normal processing of carbohydrates, proteins and fats, does not exist naturally in any non-animal forms.

But many people still choose to be vegetarian. Some, like the Jains, eat no animal product for religious reasons – and many Hindus, Buddhists and Taoists also abstain. Others don't eat meat on ethical or health grounds – 2.3 per cent of adults in the United States of America are vegetarian, and another 6.7 per cent avoid red meat.

It's a matter of choice. But perhaps it's not too much to ask that when the choice is to eat meat, it should be in moderation and with some regard for the needs of the poor and the planet, neither of which have any choice at all.

## Getting those nutrients

Vegetarians are strategic in ensuring they get the nutrients that they need, especially enough iron, protein and vitamin B12, all readily available from animal sources. Carnivores get much of them from meat. Vegetarians use, among other foods:



Steve Bailey Photography





© shunya.net

## Now for something really wild...

There's an awful lot to eat out there, but we actually cultivate very little for food. About 70,000 of the planet's 270,000 known plant species are known to be edible – but only 120 are widely grown. And just nine of these provide three quarters of our plant-based foods. As a result, humanity has become dangerously dependent on just a few crops, and the special flavours and nutritional benefits of older and wild varieties have been lost.

Yet all over the world, people still tap into the great variety of the Earth's uncultivated harvest. Sometimes it's part of traditional culture, like the linings from cave birds' nests that have been used in soup in China for centuries. Similarly, native Alaskans value a subsistence lifestyle that feeds on berries, seaweeds, fish and seal.

Wild-gathered food is essential to many of the world's poorest people. In rural India, wild greens provide much-needed vitamins, calcium and iron. In Ethiopia, wild fruits and berries crucially supplement children's vitamin-deficient cereal-based diets. And wild tubers, small fish and animals from fields and forests make up between 40 and 100 per cent of the diet of the rural poor in Bangladesh.

Some foods are so dependent on the wild that they cannot be farmed. The Brazil nut – almost entirely harvested from Amazon forests – can only be pollinated by a particular bee, and requires rodents with very sharp, strong teeth to propagate it. The sheanut, an important West African food, is also restricted to the wild, while the truffle – a fungus that grows underground only in certain soils at the roots of particular trees – is famously hard to cultivate.

Appreciating wild foods can help conserve biodiversity. Gathering matsutake mushrooms in Mexico and exporting them to Japan keeps forests standing and local people in work. And at least 137 different species, from bears to eagles, depend on preserving the runs of Pacific wild salmon.

Overexploitation, of course, can bring disaster. Witness the plight of the world's fisheries, the last major source of food that relies on the wild. And the same kind of tragedy is unfolding with the hunting of wild 'bushmeat' in Central and West Africa. Yet, if used sustainably, there's plenty of wild food there to be harvested – and to remind us of our ultimate dependence on nature – for free!

**Pulses** including peas, beans (kidney, black-eyed, etc), lentils and chickpeas, all sources of protein and iron.

**Nuts** including almonds, pine kernels, cashews, peanuts and walnuts also provide iron and protein.

**Vegetables** such as broccoli, spinach and kale are good for protein and other nutrients, while parsley, water-

cress and edible seaweeds provide iron.

**Dairy produce and free range eggs** should provide most of the small amount of vitamin B12 needed, and it can also be obtained from fortified foods such as yeast extracts, soya milks, 'veggieburgers' and some breakfast cereals.

### Grandma's super soup

As a kid, I spent every summer at my grandparents' house in a village near Krakow. I remember the beautiful landscapes, rural lifestyle and – of course – delicious food. My grandmother's cuisine was traditionally Polish, using only natural ingredients.

On growing up, I was astonished to realize that one of the soups she cooked most often was made from a wild herb – common sorrel (*Rumex acetosa*), found in almost every meadow in Europe and in many temperate areas on other continents. It can also be easily cultivated.

Sorrel – rich in vitamin C and beta-carotene – can be used in salads, sauces and – above all – soups. Just braise a bunch of the leaves in butter, then purée it and add it to boiling stock. Easy! And its sharp, sour flavour goes well with hard-boiled eggs or toast.

As a herbal medicine, it has traditionally been used to treat liver ailments and in compresses to help boils and wounds to heal. It is true that people with certain medical conditions, such as arthritis, rheumatism or kidney problems shouldn't eat too much sorrel... but then, used wrongly, most medicine can have negative effects.

So if you're bored with Japanese sushi, Italian pasta and American burgers and live in temperate climes, try gathering some sorrel, make soup, and enjoy a taste of the wild!

Maciek Durbas, Poland



# A FAIR FIGHT



Jennee Payne

For years, Guatemalan farmer Felipe Miza Castro could not get a decent price for the coffee he grew on 90 per cent of his 0.2-hectare plot (the remainder was devoted to growing corn and beans to help feed his family). The idea was that the coffee would be sold to buy the rest of the food they needed – and other essentials like clothes and medicines. But, at times, he says, ‘the price we got for our coffee didn’t even cover the cost of producing it’. Small independent farmers like him suffer because they don’t have direct access to the world market, and prices are unstable.

Then, some 10 years ago, he joined a local Fairtrade farmers’ cooperative called Manos Campesinas. Like most such cooperatives around the world – whether producing coffee as here, bananas in the Caribbean and South America, or cacao or mangoes in West Africa – it helps farmers join forces and produce enough to export directly to distributors who guarantee a minimum rate. When the produce gets to the shops stamped with the Fairtrade label, it may cost more, but consumers know the farmers are being paid fairly. When Felipe sells through the cooperative, he makes more than twice as much for his efforts than he would without it.

And it’s not just about prices. Fairtrade also certifies safe working environments and sustainable agricultural practices that benefit the environment. Premiums received by the cooperatives are invested in things that also help tackle poverty, such as water pumps, health care, training or better production processes. Manos Campesinas helps its members convert to organic farming, and plans to buy a mill to process the coffee, thereby doubling its market value. And Fairtrade can help farmers diversify so that their livelihood doesn’t depend on a single crop. With his extra income, Felipe began growing avocados, bananas, lemons and oranges to supply local markets, making it possible for him to send his children to school.

The concept of Fairtrade began in the 1940s with selling handicrafts from developing countries, first at church sales and the like, and then, 20 years later, on a large scale by such organizations as Oxfam.

In the 1980s, Fairtrade coffee, tea and other crops began to appear. But the movement only began to take off with the first certification and labelling scheme launched in 1988 by the Dutch NGO Solidaridad. Soon labels were proliferating throughout Europe, followed by North America and Japan, and in 2002 a worldwide certification scheme was launched under an internationally recognized logo.

Sales now exceed \$3.6 billion a year (they jumped by 47 per cent in 2007 alone) and more than a million certified Fairtrade farmers and farm workers in 58 developing countries benefit, producing a host of crops from coffee to cotton, and honey to herbs and spices.

Some economists, however, object that Fairtrade could make most developing farmers worse off. By giving its own producers better prices, the argument runs, the scheme encourages them to grow more of their crops, and this could lead to oversupply, driving down prices for everyone else. Fairtrade retorts that what this theory predicts does not actually happen on the ground.

What is clear is that while Fairtrade revolutionizes the lives of people like Felipe, it alone cannot change the fortunes of all developing world producers. It only accounts for a tiny proportion of the market – even its coffee, for example, accounts for less than 1 per cent of world production and consumption. And the 1 million people who benefit are an even tinier proportion of the world’s poor farmers. What they also need is a change in the unfair trading systems of the global economy. Fairtrade is a step in the right direction.



## Organic food labels

The organic movement has grown from a handful of small, independent farmers reacting to industrial agriculture to a huge global market. Definitions vary by country, but organic produce tends to be grown without – or with a restricted use of – manmade fertilizers or pesticides, without genetic modification, sewage sludge, human waste or growth hormones. Organic farmers instead rely on such time-honoured techniques as rotating crops, good animal husbandry, using compost and manure, and organic pest control. Typically, land must be farmed like this for several years before it can be certified. Processed foods are classed by the percentage of organic ingredients they contain. Schemes include those of the Soil Association in the United Kingdom, the Japanese Agricultural Standard, and Australia Certified Organic, among many more. There is also the International Federation of Organic Agriculture Movements, an umbrella organization whose label verifies that the product also meets its standards.

### Roundtable for Sustainable Palm Oil (RSPO)

Palm oil production is soaring. This is partly driven by the increasing demand for biofuels, since it is a particularly good source of energy. But the inexpensive and nutritious oil is also used in countless food products, from snacks to breads, breakfast cereals, margarine and ice cream. Yet, as demand grows, rainforests and, increasingly, peatlands, are being cleared for plantations, destroying priceless habitat (and endangering the orang-utan) and releasing vast amounts of carbon dioxide to add to global warming. Organized by conservation organization WWF, the Roundtable for Sustainable Palm Oil brings together planters, producers, businesses and other interested parties in order to develop ways to produce and market palm oil without destruction, and has launched a certification scheme to identify whether the oil comes from a sustainable source. WWF has also initiated a Roundtable for Responsible Soy, which is likely to lead to similar certification.

# CHECK the label



RSPO  
Roundtable on Sustainable Palm Oil



### Forest Stewardship Council (FSC)

Food is one thing, but what about its paper or cardboard packaging? Does it have the FSC label stamped on it? And what about your barbecue charcoal used to cook it, or the table it is set upon? The FSC sets standards for environmentally friendly wood, and its label certifies that the product was made of timber legally logged from sustainably managed forests, without harm to natural old-growth forests or indigenous forest peoples. It can also be traced back to the point of production, making its origins certain.

### Marine Stewardship Council (MSC)

A billion people primarily depend on food from the sea, and demand for it continues to increase. Yet fish cannot be harvested forever: more than 70 per cent of stocks are exploited to the full, overfished or depleted. Unsustainable practices – like throwing unwanted fish back into the sea – make the problem even worse. The MSC, an independent, global non-profit organization, sets a standard for sustainable and well-managed fisheries, based on an FAO Code of Conduct. So far, it has certified 14 fisheries and more than 300 seafood products around the world.

### Energy-efficiency labels

Household appliances – used to store or cook food – now have to be labeled in many countries to certify that they are energy-efficient or to rate the product's performance. The European Union's rating system, which labels appliances from A to G, has worked so well that appliances have steadily climbed up the ratings, growing more energy efficient in response to public demand.

How green are the green veg? Were wild flowers destroyed to grow the grain for the flour? And how can you be sure? Increasingly, a label will give you the answer, for as consumers become ever more concerned about their food's green credentials, certification schemes have emerged to track everything from its carbon footprint to whether it has been grown with pesticides.

Labels empower people who want to make environmentally friendly choices, and provide incentives to producers and manufacturers to go green. They are cost-effective, increase choice, and share the responsibility for change between producers and consumers. Here are some schemes.

### Rainforest Alliance

This NGO certifies 31,727 farms covering 458,569 hectares in 19 countries around the world, working with farmers to help them meet standards for protecting wildlife and land. It believes that protecting special areas alone will not save the world's biodiversity, and so works to conserve the natural world by supporting sustainable agriculture at the same time as safeguarding ecosystems. Thus it encourages the growing of coffee or cocoa, for example, without cutting down rainforest. Its certification label – for tropical crops such as bananas, coffee, oranges, cocoa or tea – means they were farmed with attention to water pollution, soil erosion, pesticide use, wildlife and habitat protection, waste reduction, water conservation, efficient management and good working conditions, including fair wages and access to education and health care.

# 7



# food wonders

## Chinese New Year

Tina Lee

It is the most important festival in the Chinese calendar and its food is rich in symbolism. On New Year's Eve, families typically offer their Kitchen God – the guardian of the family hearth – a dinner to report to heaven on their family's behaviour. Some say the sweet sticky foods served are bribes: others that they seal his mouth against saying bad things. A bit of fish is traditionally left at the end of the New Year's feast: the word for fish, *yu*, sounds like those for both wish and abundance, so it is thought to ensure prosperity. Dishes are often served whole because slicing and cutting can suggest bad luck, like the severing of family ties, and uncut noodles signify long life. The 'tray of togetherness', offered with tea, is circular or octagonal and divided into compartments, each filled with a symbolic snack – such as coconut for unity, dried lotus root seeds for fertility and peanuts for longevity.



## Eid el-Fitr



Karen Eng/Al Amin

When the new moon signals the end of the holy month of Ramadan – when Muslims fast from sunrise to sunset – the festival of Eid el-Fitr begins. The festival generally lasts three days, and its traditional celebratory foods vary from region to region. Fijians break their fast with toasted noodles called *savayya*. In Iraq, a family may serve a sacrificed lamb along with a date pastry called *klaicha*. In India, *biryani* – with rice, meat or fish and vegetables – is popular. And in Palestine it is usual to enjoy *mansaf* (lamb in yoghurt). Indonesians may tuck into a layered cake called *lapis legit*, while Somalians favour a custard flavoured with cumin called *halva*. Malaysians feast on sticky rice cooked in bamboo cane, called *lemang*. Food is more than celebratory at Eid; it also stresses *sakat* – the obligation to share food with others. So large amounts are often cooked to be shared with friends and to be given as alms to the poor.

Ancient significance pervades every detail of every dish served at the celebration of Persian New Year, or the Nowruz Spring Festival, at the spring equinox. The name of each dish served begins with the Persian letter 's', and each stands for one of the seven angelic heralds of life. *Sabzeh*, or sprouts, typically wheat or lentil, stands for rebirth and fertility; *samanu*, a pudding, symbolizes the sweetness of life; *sib*, or apple, represents beauty and health; *senjed*, the fruit of the lotus tree, represents love; and *seer*, or garlic, symbolizes medicine and health. *Somaq*, sumac berries, stands for sunrise and the belief that good conquers evil. Finally, *serkeh*, or vinegar, represents age and patience. During the festival, families gather to call in the New Year. After the equinox has passed and prayers have been offered, the eldest person at the celebration begins the well-wishing by standing up and distributing sweets, pastries, coins and hugs.

## Nowruz Spring Festival

Alireza Najafian (Iran)





## Day of the Dead

Mexico's *Día de los Muertos* – celebrated, in fact, over the first two days of November – is rooted in the ceremonies of the ancient Aztecs, who believed that souls could briefly return home to visit from Mictlan, the land of the dead. Naturally, they must be fed to sustain them on the long journey. The festival's foods include skulls made from sugar, chocolate or amaranth carrying the names of the honoured deceased on their foreheads. Similarly there's *pan de muerto*, or bread of the dead, which resembles a skull or set of bones. Families set up altars dedicated to the souls of their loved ones. Sometimes even a water basin and towel are provided so that spirits can wash before the feast. Relatives and friends also visit cemeteries, where they eat the deceased's favourite foods and decorate the grave with marigolds, candles, gifts and sometimes even a bottle of tequila.



Ana Caballero/The Art of Skulls

## Ethiopian Tej



Rudy Neeser

You could call *tej* King Solomon's wine. Ethiopia's national drink, the mead wine is believed to have been carried as a gift to the king's court and used for a toast between him and the Queen of Sheba, the mother of the country's first king. Thought to be one of the world's earliest fermented drinks – made of honey and *gesho* (*Rhamnus prinoides*), organic hops found only on Ethiopia's highlands – *tejis* mentioned in ancient texts and scriptures dating back 4,000 years. Traditionally prepared primarily by women, it was once drunk only by the privileged, but now no feast or celebration is complete without its unique bittersweet flavour. Ethiopia is the largest honey-producing country in Africa. Approximately 70 per cent of what is sold in the country is used to make *tej*, so central is this iconic wine to its culture.

No one knows what was on the menu at the first Thanksgiving at Plymouth in New England in 1621 – but it certainly was not the full traditional array of turkey, sweet potato, sweet corn, cranberry sauce and pumpkin pie. All we know from contemporary sources is that wild fowl was served, along with venison, so at least the all-important turkey may have been present. It would hardly be surprising, for the plentiful wild turkeys were a fixture of Native American diets and literally lifesavers for the early European colonists. Vegetables did not feature much in 17th century feasts, and were limited to their seasons. And as the pilgrim fathers did not have an oven, there would have been no pie. But none of this detracts from the importance of the festival, both in the founding of the nation and as the most important family occasion of the year.

## Celtic Hallowe'en

Podchef/Flickr



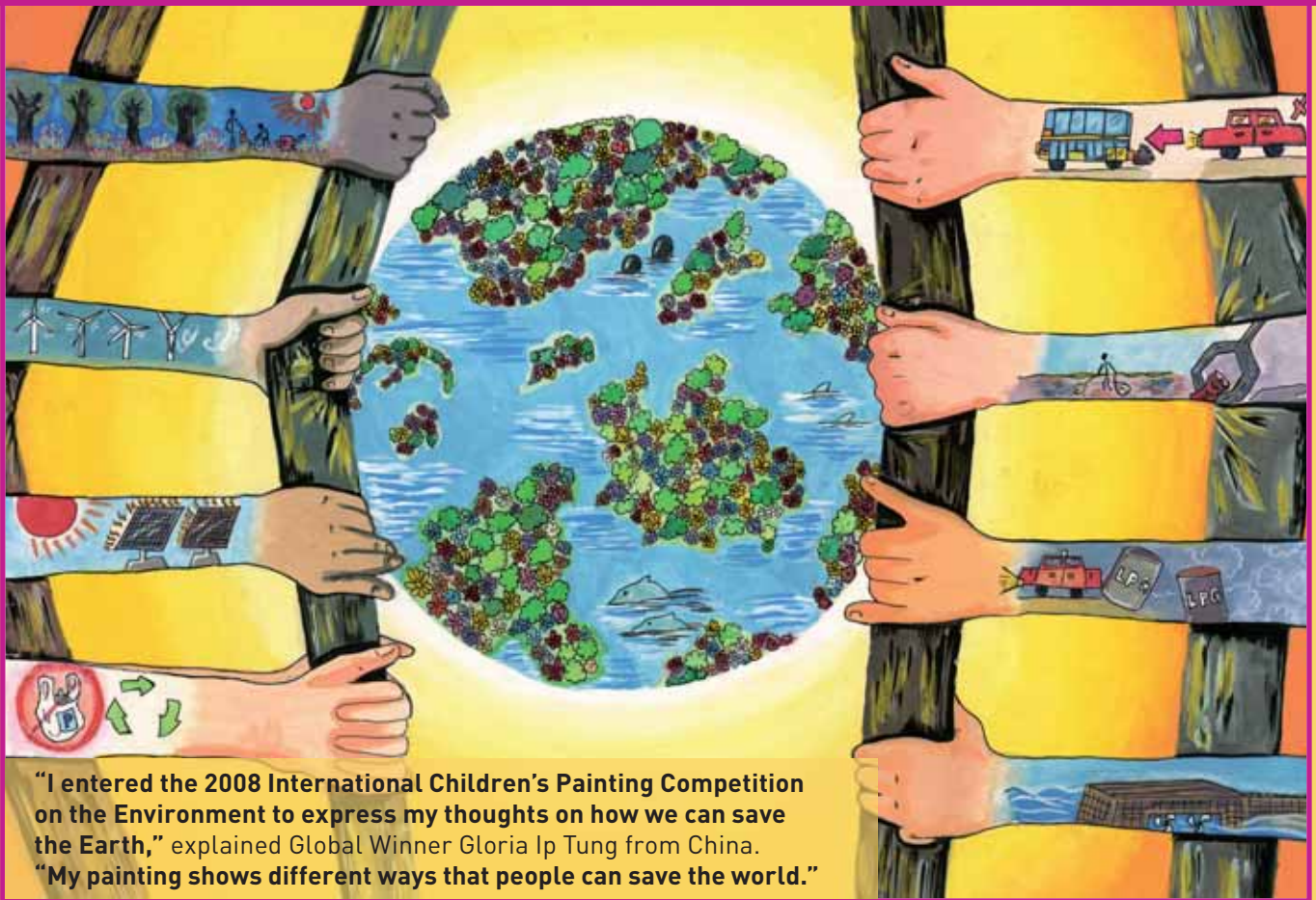
Barm brack – a traditional Irish fruit bread – comes from the ancient Celts and was used to predict the future. They served it on 31 October, at the start of the ancient Celtic harvest festival of Samhain – now Hallowe'en – when they believed that the souls of the dead could visit. Baked into each cake are six symbolic objects: a coin, a ring, a pea, a thimble, a stick and a piece of cloth. Interpretations vary, but the person who gets the coin is typically said to be destined for riches, while anyone who bites into the ring is destined to marry within the year. The rest are not so lucky: anyone who gets the pea or thimble will not marry, the person with the stick will have an unhappy marriage, and the unfortunate who comes across the piece of cloth is destined to be poor.

## Thanksgiving Turkey



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# Shaping the future



Why not have a go, and enter the 2009 International Children’s Painting Competition on the Environment. For more details see [http://www.unep.org/tunza/children/inner.asp?ct=competitions&comp=int\\_comp&int\\_comp=18th](http://www.unep.org/tunza/children/inner.asp?ct=competitions&comp=int_comp&int_comp=18th)

