

WATER

When it rains, soils filter the rainfall and store it. This is a good thing, for it gives us clean groundwater and water to drink. But it not only quenches our thirst. Worldwide we use around 4,000 cubic kilometres of freshwater annually to irrigate our crops, take our daily shower and cook our meals. That's around one and a half times more water than is contained in Lake Victoria in East Africa.

Every individual has basic needs that can only be met through **HEALTHY SOILS.**

WAGES & WORK

Agriculture not only gives us food security. For many people, it is also the main source of income. Worldwide, 1.3 billion people are employed in agriculture – 40 per cent of the global workforce.

CLOTHING

40 per cent of the textile fibres used to make clothing comes from crops and thus from the soil.

FOOD

Humankind has been farming arable land for thousands of years. Agriculture and animal husbandry depend on fertile soils, which safeguard our supply of food.

ENERGY

Energy is vital. Wood is a good example: it is one of the main sources of energy for heating and cooking, especially in the developing world. Europe is also increasing its use of bioenergy, such as biofuels and biogas.

**“SOIL IS A RESOURCE,
A LIVING, BREATHING
ENTITY THAT, IF TREATED
PROPERLY, WILL MAINTAIN
ITSELF. IT’S OUR LIFELINE
FOR SURVIVAL.”**

Marjorie Harris

Canadian author of gardening books



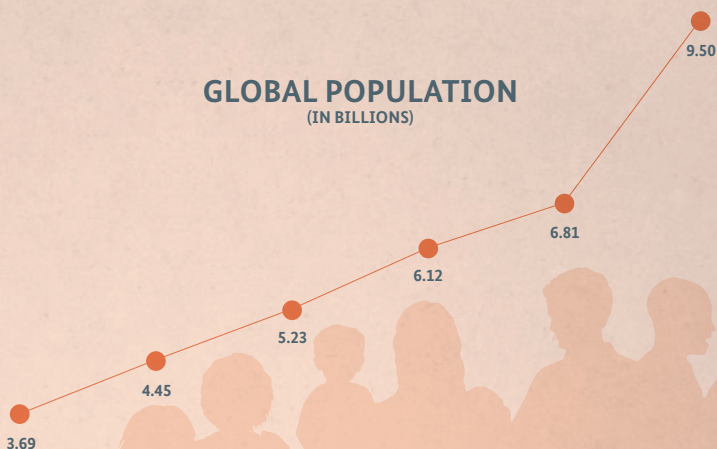
There are around **450 MILLION SUBSISTENCE FARMERS** worldwide, mainly in developing countries. Subsistence means that farmers mainly produce for their own consumption, selling only a small proportion of the harvest in local markets. Four out of ten people worldwide thus directly depend on the soil beneath their feet. On average, these smallholders have less than **TWO HECTARES OF LAND** available to them. Farmers in Europe, in contrast, who produce for their domestic markets and for export, use **27 HECTARES** on average – and the average farmer in the USA has a staggering **121 HECTARES**.

Many smallholder families live in absolute poverty and some suffer hunger. They can barely produce enough food to feed their families, let alone invest in education, health or better seed. Driven by their poverty, they start to cultivate unsuitable land, which rapidly degrades. **A VICIOUS CIRCLE OF POVERTY** begins, accelerated by population pressure in many regions. All that is left is barren soil. Ultimately, many people flee to the cities.

Equipped with know-how, appropriate seed and tools, many smallholders in developing countries and emerging economies would be able to increase their yields, enabling them to feed not only themselves and their families but other local people as well. While industrial agriculture has largely exhausted its potential to further boost yields, the land cultivated by smallholders offers the **GREATEST POTENTIAL** for urgently needed increases in production.

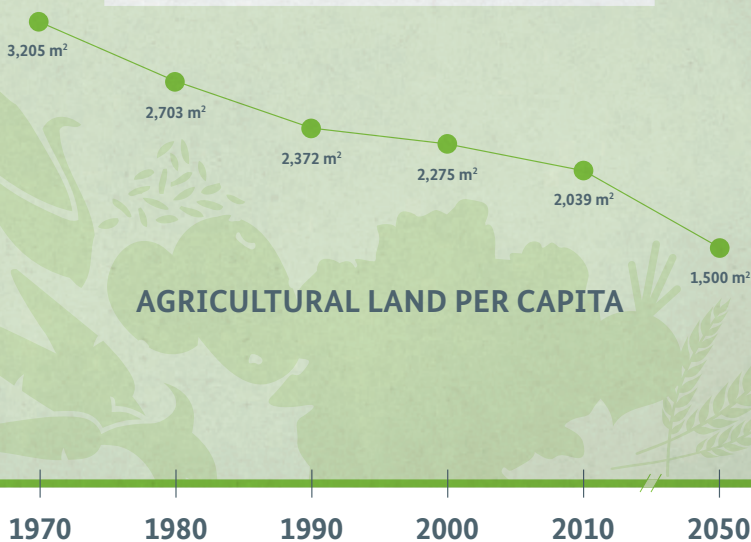
**RURAL AREAS WILL DECIDE
THE FUTURE OF THE FOOD
SUPPLY.**

GLOBAL POPULATION (IN BILLIONS)



Land covers less than 30 per cent of the 51 billion hectare surface of the Earth. The rest is covered by water. Of the land surface, **12 PER CENT IS USED FOR ARABLE FARMING** and **25 PER CENT FOR PASTURE**. This utilised area is expanding steadily, at the cost of forests and other natural ecosystems that are vital for soil conservation and other functions.

But soils capable of sustaining agriculture are distributed very unevenly: in tropical regions in particular, arable land is scarce. We already know that to feed a growing world population in future, we will have to maintain the health of the available land so that it can deliver higher yields sustainably.



AGRICULTURAL LAND PER CAPITA

LAND SCARCITY



MANY COMPETING INTERESTS



LAND HAS BECOME A COMMODITY



Land is a finite resource and has become a highly desirable commodity for various interest groups. Often, control of the best land and soils, especially in developing countries and emerging economies, passes to overseas agricultural companies and investors so that it can be used to grow food, animal feed, energy crops and other farm products for export. According to the Land Matrix online database, more than 54 million hectares of land – an area roughly as large as France – have been the subject of land deals in the last 15 years. Almost 38 million hectares – an area larger than Japan – were the subject of concluded land deals.

In these transactions, the fact that the land is inhabited is often overlooked. In developing countries and emerging economies in particular, indigenous and local communities are often forcibly resettled or expelled. Many of the affected communities have lived on the land for generations but have no formal registration documents (land titles) that would provide evidence of their rights to the land. And even if they possess these documents, they have very little chance of enforcing their rights in complex international land deals. As a result, the global hunger for fertile land often causes conflicts at the local level.

RISK LAND DEGRADATION



More intensive use depletes the soil

RISK EXPULSION AND CONFLICT



Land deals drive local communities off their land

RISK FOOD SCARCITY



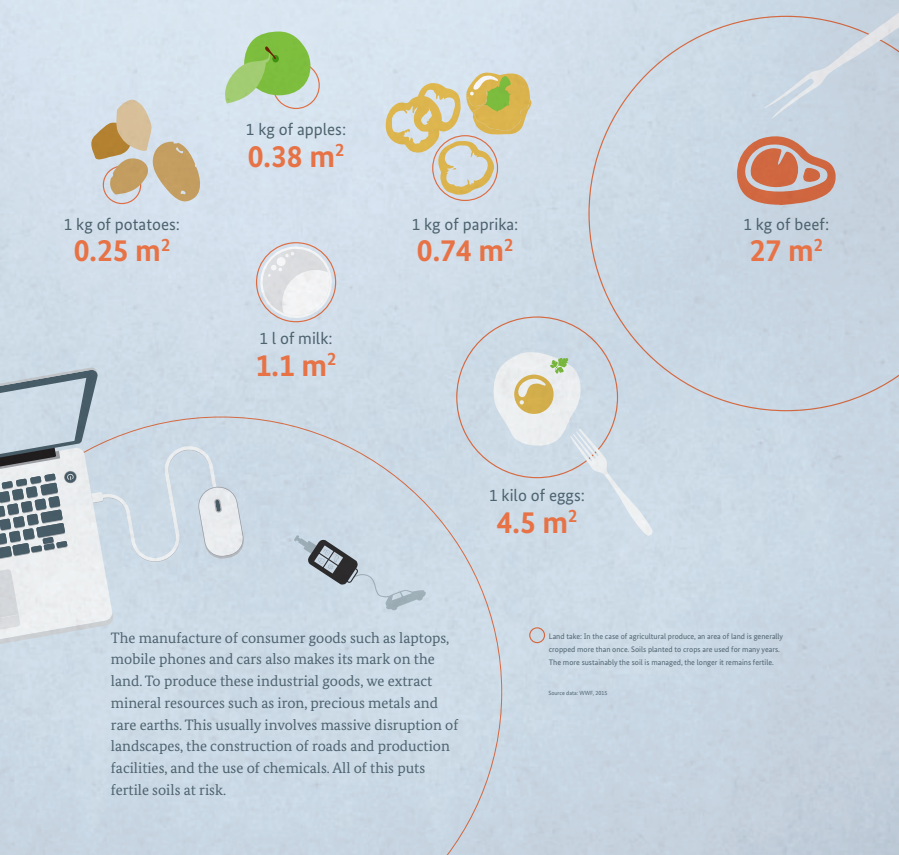
Food prices rise.
Poverty and hunger increase.



FOOTPRINTS IN FARAWAY COUNTRIES.

If we are to eat an egg for breakfast, fertile land is needed. The same applies to the cup of coffee that goes with it. We need land to produce every single item of food we eat. Unless it is managed sustainably, this land gradually degrades. What's more, the land is often not located in our own country. A full **60 PER CENT OF THE LAND UTILISED FOR EUROPEAN CONSUMPTION IS LOCATED OUTSIDE THE EU**. Every year, the EU leaves a **LAND FOOTPRINT** of around 640 million hectares in the countries from which it imports "virtual land". As a result, this land is not available for local food production.

If distributed equitably, 0.2 hectares of land would be available to every person on Earth. Comparison of land footprints around the globe, however, reveals a **MASSIVE IMBALANCE**: a small proportion of the world population, mainly in industrialised countries, takes far more than its fair share of the land. Six of the ten countries importing the largest amounts of virtual land are European. Germany is one of them. On average, an EU citizen utilises 1.3 hectares of land in a year – around six times more than a person in Bangladesh.



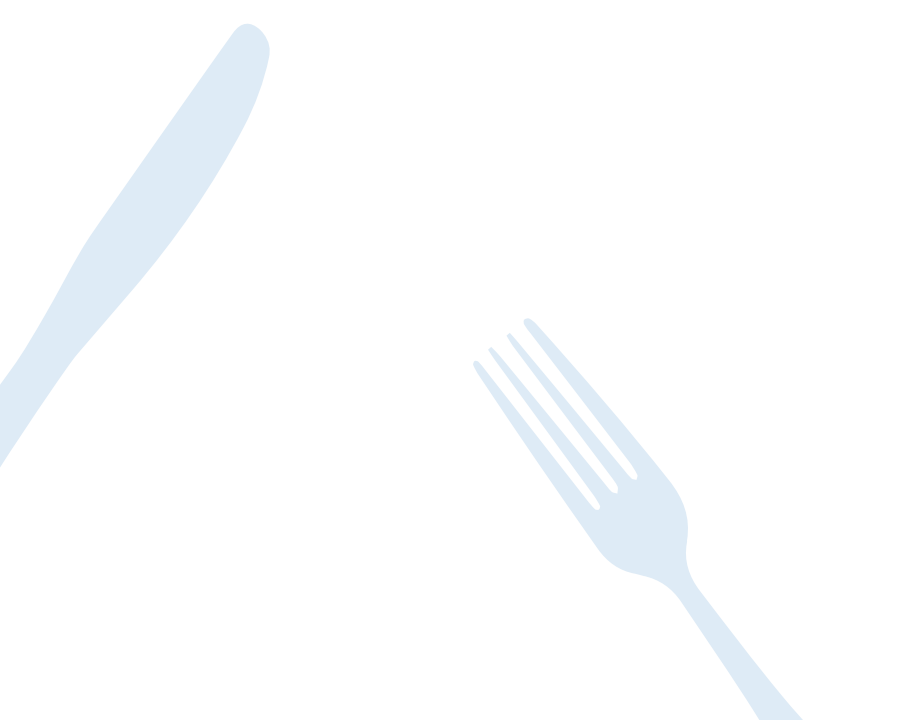
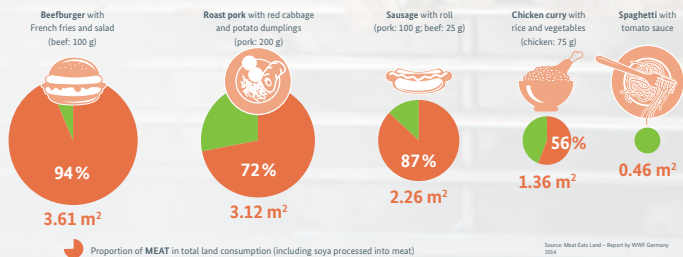


MEAT NEEDS LAND.

The appetite for meat is growing: over the past 50 years, global meat production has quadrupled. More than 300 million tonnes of meat were produced in 2012 – a new record. Worldwide, **PER CAPITA MEAT CONSUMPTION** thus averaged **42.5 KILOS PER YEAR**. Land use expands in step with meat consumption. Many areas used for grazing and animal feed cultivation would feed far more people if they were used to grow crops. One hectare can produce 7,100 kilos of cereals – or 480 kilos of beef.

There is still a striking meat consumption gap between rich and poor. However, the developing countries and emerging economies are catching up. Per capita meat consumption in Europe amounted to an estimated 66.2 kilos in 2010–2012. But Brazil has already overtaken Europe at 82.3 kilos, and at 46.4 kilos per capita, China's meat consumption is catching up rapidly. Meat consumption is expected to continue to grow worldwide.

Land use for typical foods





104 FOOTBALL FIELDS

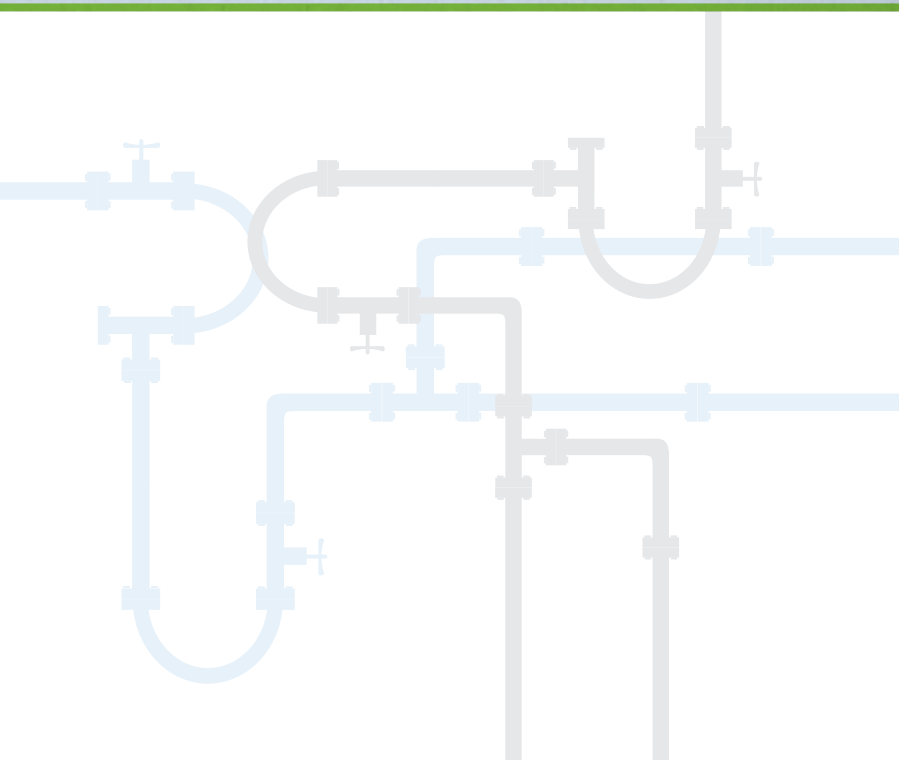
Even in countries with shrinking populations, large areas of land are being built on. Daily land consumption in Germany, for example, amounts to around **73 HECTARES**, an area roughly the size of **104 FOOTBALL FIELDS**.



WHEN A CITY GROWS, FERTILE LAND SHRINKS.



Cities and transport infrastructure are expanding all over the world, particularly in developing countries and emerging economies. If this trend continues, **URBAN LAND COVER** will increase by around 1.5 million square kilometres – an area the size of France, Germany and Spain combined – by 2030. This growth is mainly occurring in areas where good soils support human development. But urban growth destroys the fertile land that attracted people to these regions, burying it under asphalt and concrete. This loss of arable land often causes hunger and poverty in developing countries. If land has been built on, it can no longer be used to grow food. Precious land and soils are also being lost in the industrialised countries, leading to even more outsourcing of food production to other countries.





CAUTION: SOIL IS FRAGILE.

Soils safeguard our food supply, provide safe drinking water and protect the climate – but still we treat them very badly. Each year, a further 20 million hectares of arable land degrades to such an extent that it can no longer be used to grow crops. Why is this happening? One reason is the use of unsustainable agro-industrial farming techniques, which cause degradation. Another is smallholder farmers' use of inappropriate cultivation practices, which stress fertile soil.

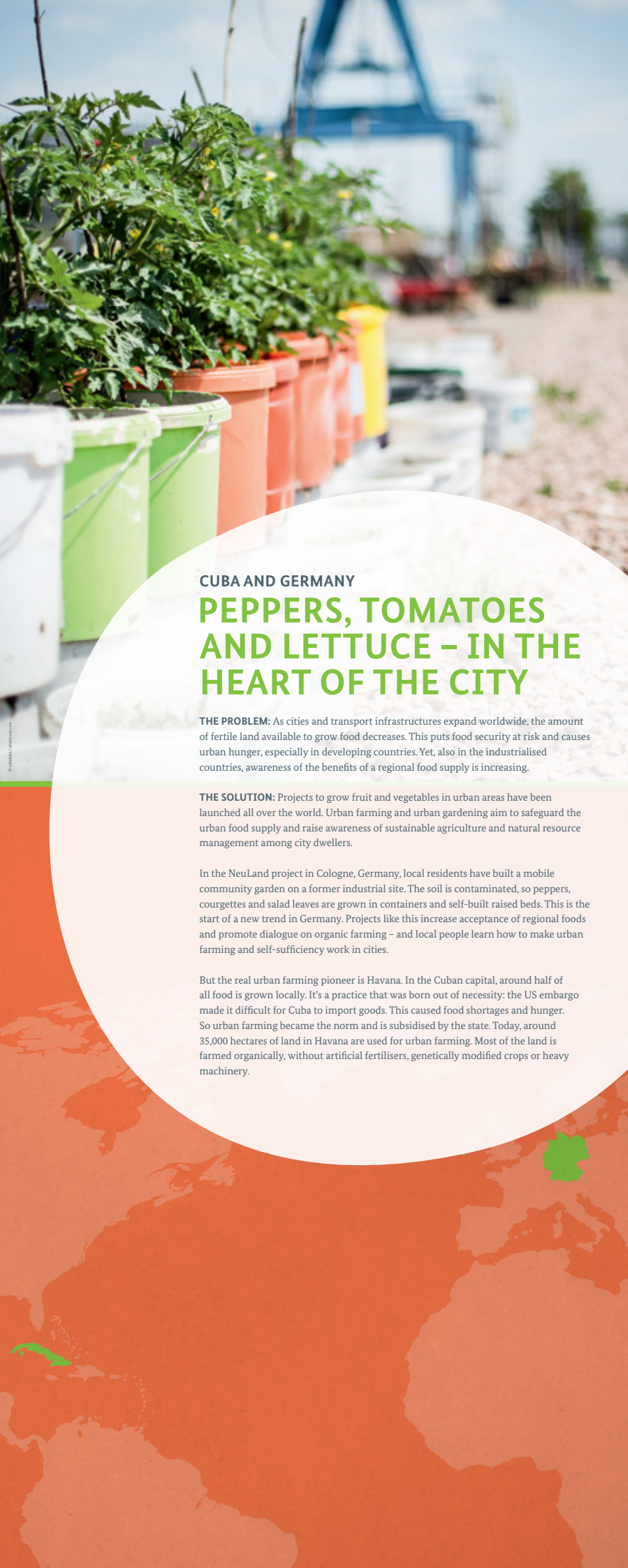
POSSIBLE DAMAGE FROM AGRO-INDUSTRY:

Heavy farm machinery compacts the soil. Monocultures, pesticides and herbicides damage biodiversity in the soil. Excessive use of nitrogen fertilisers contaminates groundwater. Overgrazing and crop growing on unsuitable land, such as steppes, degrade soil. Poor irrigation causes salinisation.

POSSIBLE DAMAGE FROM SMALLHOLDER FARMING:

Growing crops without replacing the nutrients depletes the soil. Smallholder farmers often lack access to suitable fertilisers. Removing vegetation and burning residues deprive the soil of additional biomass – an important organic fertiliser. Unregulated grazing devastates vegetation and fertile soils.





CUBA AND GERMANY

PEPPERS, TOMATOES AND LETTUCE – IN THE HEART OF THE CITY

THE PROBLEM: As cities and transport infrastructures expand worldwide, the amount of fertile land available to grow food decreases. This puts food security at risk and causes urban hunger, especially in developing countries. Yet, also in the industrialised countries, awareness of the benefits of a regional food supply is increasing.

THE SOLUTION: Projects to grow fruit and vegetables in urban areas have been launched all over the world. Urban farming and urban gardening aim to safeguard the urban food supply and raise awareness of sustainable agriculture and natural resource management among city dwellers.

In the NeuLand project in Cologne, Germany, local residents have built a mobile community garden on a former industrial site. The soil is contaminated, so peppers, courgettes and salad leaves are grown in containers and self-built raised beds. This is the start of a new trend in Germany. Projects like this increase acceptance of regional foods and promote dialogue on organic farming – and local people learn how to make urban farming and self-sufficiency work in cities.

But the real urban farming pioneer is Havana. In the Cuban capital, around half of all food is grown locally. It's a practice that was born out of necessity: the US embargo made it difficult for Cuba to import goods. This caused food shortages and hunger. So urban farming became the norm and is subsidised by the state. Today, around 35,000 hectares of land in Havana are used for urban farming. Most of the land is farmed organically, without artificial fertilisers, genetically modified crops or heavy machinery.



INTERNATIONAL

“ECONOMICS OF LAND DEGRADATION” – INVESTMENT IN SOIL CONSERVATION PAYS OFF



THE PROBLEM: Despite the very serious impacts of land degradation, maintaining soil health is a low priority even today. The enormous annual economic losses due to land degradation – at least USD 40 billion – tend to go unnoticed until the social, environmental and economic impacts become almost impossible for countries to manage.

THE SOLUTION: Together with the United Nations Convention to Combat Desertification (UNCCD), the EU and the German Federal Ministry for Economic Cooperation and Development (BMZ) launched the Economics of Land Degradation (ELD) Initiative in 2010. In this global network, scientists and experts are working to identify the social, environmental and economic costs of land degradation and show how they can be avoided through early investment in sustainable land management. These economic arguments help to mobilise policy-makers and businesses to commit to active soil protection and sustainable land management. The international dialogue is already bearing fruit: the Initiative helped to ensure that ELD segments were included in the UNCCD decisions and Burundi's national agricultural strategy, and supported the integration of ecosystem services valuation into sustainability standards in Peru. The ELD Initiative is continuing to attract wide interest and is stepping up its efforts to raise awareness and develop international capacities through training, workshops and e-learning. A Massive Open Online Course (MOOC) on the economics of land degradation was delivered for the first time in 2014. The Initiative will build on that experience by delivering further courses.