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The GIZ Magazine

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Soil – a vital resource

A basic necessity for a growing global population

OTHER TOPICS:

Made in Africa: Cotton for the global market

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COVER PICTURE: NORMANN SZKOP

Patchwork tapestry: this field of flowers was photographed near the village of Anna Paulowna in the northern Netherlands.

giz COMPANY PROFILE

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH offers sustainable and effective solutions for political, economic and social change processes. GIZ is a federal enterprise that employs more than 17,000 staff members and operates in over 130 countries worldwide.

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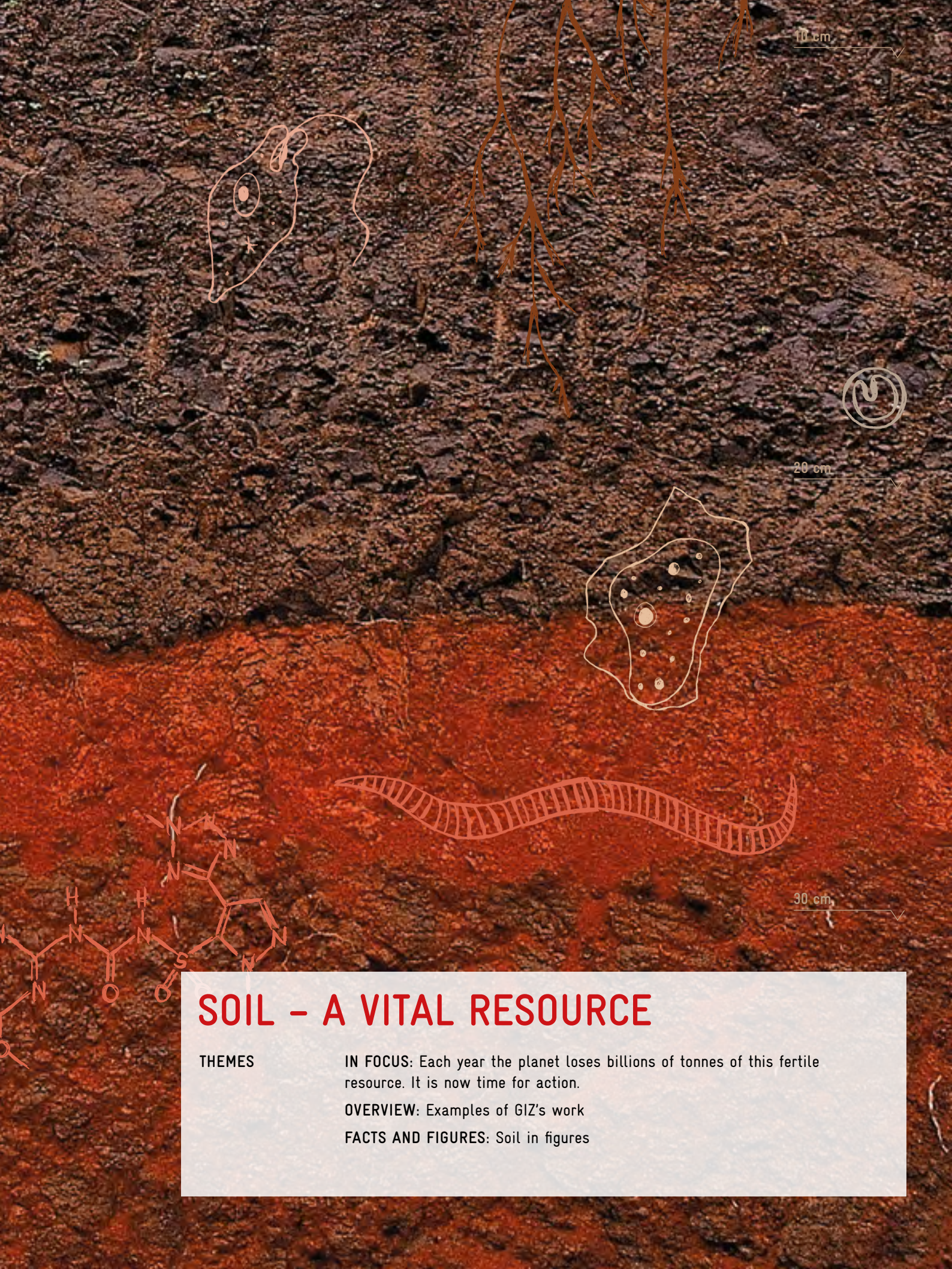


SOIL – A VITAL RESOURCE

THEMES

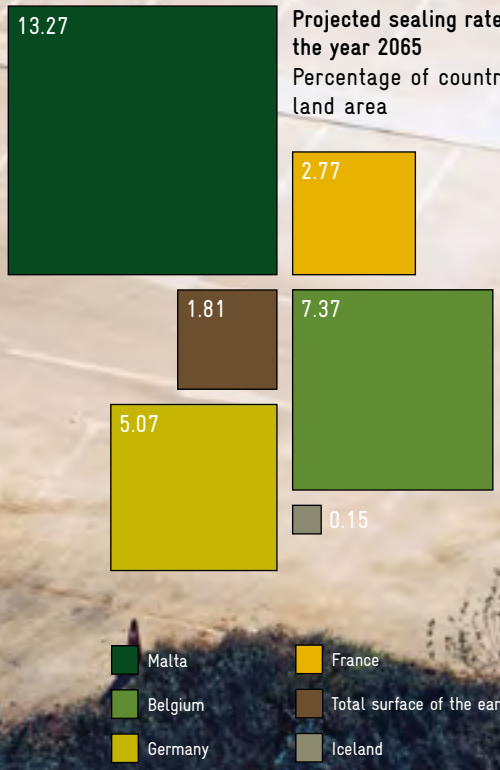
IN FOCUS: Each year the planet loses billions of tonnes of this fertile resource. It is now time for action.

OVERVIEW: Examples of GIZ's work

FACTS AND FIGURES: Soil in figures

SEALED LAND

Whether constructed above or below ground, buildings prevent rainfall from entering the soil. Sealing land in this way severely inhibits – and even prevents – the occurrence of natural soil processes.



Projected sealing rate in the year 2065
Percentage of country's land area

The forgotten resource

After water and air, life on earth depends on a third factor: soil. This natural resource provides the growing global population with food, raw materials and living space. But each year the planet loses billions of tonnes of this fertile basic resource. It is now time for action.

Text Petra Hannen **Illustration** Denise Graetz

The global population is literally losing ground: every minute, 5.5 hectares of soil disappear beneath roads and housing developments, 10 hectares are degraded and 23 hectares are at risk of desertification. According to estimates by the UN's Food and Agriculture Organization (FAO), more than 24 billion tonnes of topsoil are lost each year – and the loss is permanent, since it takes at least 100 years for nature to create just one centimetre of new topsoil. At the same time, the continuously growing global population is expected to reach around nine billion people by 2050. Consequently, there will be less and less land available to meet the needs of more and more people for food, raw materials in the energy and consumption sectors, for space to live and for work.

Klaus Töpfer describes this process – as yet underestimated and insufficiently studied in his opinion – as a ticking time bomb waiting. 'Compared to resources such as water and environmental problems like climate change, soils have never commanded the same political and public attention,' says the Executive Director of the Potsdam-based Institute for Advanced Sustainability Studies (IASS). But now attitudes must change. In November 2012, the institute organised the first Global Soil Week in Berlin, bringing together actors from the fields of politics, science and civil society from over 60 countries to discuss the threat to soils and develop an 'agenda for action' for sustainable soil and land management. At the same time, Global Soil Week served as one of the promotional events of the Global Soil Partnership. As part of the Millennium Development Goals, this FAO initiative has been working towards a global soil partnership for food security and climate change mitigation since 2010, the aim being to sustainably manage soil resources. And last year the United Nations Environment Programme identified the loss of fertile soil as one of our most pressing problems, on a par with the as yet unresolved issue of how to safely dispose of nuclear waste in the long term.

A miscalculated risk

But not even that gave soil its first real debut on the political stage. Appearances to date have merely been brief guest performances. The topic first attracted public attention, for example, following the devastating dust storms of the 1930s that hit the Great Plains of the United States. There, farmers had dug up large areas of prairie grass in order to plant wheat. A subsequent period of insufficient rainfall caused erosion of such severity that many farmers were forced to abandon their land. These events gave rise among other things to a dedicated US agency for resource protection and to legislation such as the Soil Conservation and Domestic Allotment Act, which was drafted to protect soil. In his statement on signing the act, US President Franklin D. Roosevelt said: 'The history of every Nation is eventually written in the way in which it cares for its soil.' In the »

PHOTOS: DDP IMAGES (12–13); LARS TUNBJORK/VU/LAIF (14); SOURCE OF DIAGRAM: SOIL REPORT 2012, EUROPEAN ENVIRONMENT AGENCY

1970s, the issue of soil loss attracted attention in a different part of the world. Following a period of severe drought, the governments of the Sahel states encouraged farmers to return to their fields and with the aid of stone walls, trees and modern irrigation methods protect them from further erosion and improve soil fertility. These activities were also supported over decades by German development cooperation that in this region at least helped to minimise soil loss and increase agricultural production. But until now the topic of soil has never been a focus of worldwide attention. 'In conjunction with the debate on food security and climate change, this seems to be changing,' says Alexander Schöning, planning officer for agricultural production and resource use at GIZ. 'But the issue is complex, since soil is not just at risk from natural events or inappropriate agricultural use.' Schöning feels that the dramatic impact of growing competition for land use has been misjudged. With roughly half the world's population now living in towns and cities, for example, a great deal of land disappears each year under concrete and asphalt – and the trend is growing. The pace of sealing-in fertile soil is even growing independently of population development, as can be seen in the case of Germany. In its sustainability strategy published in late 2012, the German Government merely defined its objective as being to reduce the area used for housing developments and road building from currently 77 hectares per day to a maximum of 30 hectares per day by the year 2020 – no plans are yet in place for further subsequent reductions. The rate of land use is even more dramatic in other countries with continued population growth or rapid economic and social development.

'We can only achieve a world without hunger and poverty if we succeed in halting dramatic soil loss, learn to use our soil sustainably and start distributing it equitably.'

Professor Klaus Töpfer, Executive Director of the Institute for Advanced Sustainability Studies (IASS)

Away from cities and traffic infrastructure, competition for the use of unsealed land continues. As Schöning explains: 'A hectare of land can only be used once, for example as woodland, for grazing or for crops. And each use involves an economic interest, which has an impact on the soil, its function in the ecosystem and its quality.' The impact on biodiversity when an area of rainforest is turned into a field of soya, for example, is just the most visible aspect. According to Schöning, the significance of the role played by soil in climate change is frequently overlooked. 'After the oceans, soil is the planet's largest carbon sink, amounting to 1,500 gigatonnes. With appropriate land use, this sink could be developed further. But that would mean creating suitable incentive mechanisms.' And the topic of water must not be viewed in isolation. 'We all know that soil cannot be fertile without water. But soil also takes on vital filtration and storage functions for water. Without soil there can be no properly functioning water cycle.'

Whereas the United Nations has elevated clean water to a human right, a UN convention on transnational management of water resources is awaiting international implementation and the first Framework Convention on Climate Change was signed over 20 years ago, there is still no comprehensive convention on soil. While a Convention to Combat Desertification (UNCCD) has been adopted, 'desertification is often seen as a problem that only affects certain desert states. And yet degradation threatens fertile soils all over the world,' explains Schöning. But whatever the cause, one thing is certain: the loss of soil is a costly process for humankind. The Economics of Land Degradation initiative puts the figure at US$70 per capita per year. In the international network – which is coordinated by GIZ and was set up by the European Commission, BMZ and the UNCCD Secretariat – scientists, politicians and entrepreneurs work together to calculate the cost of soil loss. They base their work on the Stern Review produced by former World Bank chief economist Nicholas Stern, in which he calculated the economic consequences of climate change and in so doing put the topic on the international agenda. The initiative aims to do the same for soil.

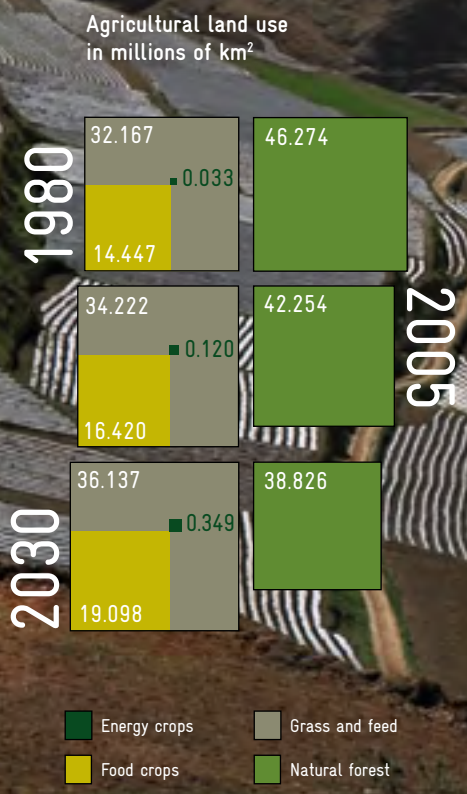
Soil overworked by agricultural use

Paradoxically, it may be agriculture – an industry so closely tied to the land – that is harming the soil and contributing in various ways to soil degradation. Intensive farming destroys the accumulated natural structure: very loose topsoils without protective plant residues are quickly eroded by rain and wind; further down in the subsoil, microorganisms which break »

PHOTOS: SHENG LI/REUTERS (17); SOURCE FOR DIAGRAM: OECD ENVIRONMENTAL OUTLOOK TO 2030

A VITAL RESOURCE UNDER STRESS

As the global population increases, ever more land is needed for crop cultivation, which comes at the expense of nature. Approaches to field use are also changing: the area on which energy crops are grown will probably have risen more than tenfold worldwide by 2030, compared with 1980.



SENSITIVE CARBON SINK

Soils store varying quantities of carbon, depending on the soil and vegetation type. Should conditions change, for example on account of deforestation or a permafrost thaw, CO_2 will leak, reducing the soil's storage capability.

Comparison of carbon content in soil across different regions

down organic substances are able to multiply. But the resulting emission of greenhouse gases is not the only problem: if the humus in the soil is not replaced by plant residues, compost or fertiliser, the soil structure degrades, reducing water storage capacity. Harvesting crops removes nutrients from the soil which must be replaced, more often than not in the form of mineral fertilisers. However, inappropriate use of mineral fertilisers can in turn lead to greenhouse gas emissions, soil acidification and pollution of drinking water. The use of heavy machinery may also compact the subsoil; plough compaction impedes both water circulation and root growth. And artificial irrigation brings the risk of salination, if more water evaporates than penetrates the soil, leaving dissolved salts on the surface.

Mining is another industry that both exploits and degrades soil at the same time. In global terms, extracting raw materials does not pose a serious threat to soil. But the consequences can be serious in the immediate environment of the extraction site – due to exploitation of the mine site itself, pollution caused by chemicals used in extraction and ore processing, and changes to groundwater levels. In order to limit the ecological footprint left by raw materials extraction, the German Government explicitly states in its Raw Materials »

EXAMPLES OF GIZ'S WORK › SOIL – A VITAL RESOURCE

Securing land rights

Project: Contribution to Securing Land Rights
Commissioned by: German Federal Ministry for Economic Cooperation and Development (BMZ)
Partner: Ministry of Land Management, Urban Planning and Construction, Cambodia
Overall term: 2011 to 2016

CAMBODIA Political stability, economic growth and social development depend on access to land being socially balanced and land management being regulated by the government. In Cambodia, land rights often remain unresolved, with landless people settling on government land; this in turn leads to conflicts and forced displacement. GIZ advises on drafting basic and legal texts to establish a framework for land reform. It also trains experts and advises on technologies for land surveying. And it places particular emphasis on the development of grass-roots institutions and public consultations. The project's main objective is to secure land rights and human rights for the landless population, women, indigenous groups and informal settlers. About 1,000 surveyors are already working on initial land registration and two million land property titles have so far been issued. Three indigenous communities have received collective land titles.

Conserving and protecting soil

Project: Sustainable Land Management
Commissioned by: German Federal Ministry for Economic Cooperation and Development (BMZ)
Partner: Ministry of Agriculture, Ethiopia
Overall term: 2005 to 2014

ETHIOPIA In parts of Ethiopia, people are at risk of food insecurity. Deforestation, soil degradation and erosion result in poor harvests, with climate change and population growth exacerbating an already difficult situation. Ethiopia's Sustainable Land Management Program is supported by the World Bank, the EU and the Governments of Finland and Germany. GIZ provides advisory services to develop the institutional capacities and technical know-how required to implement the programme. Erosion control and improved soil fertility have already enhanced the potential of 142,000 hectares of degraded land. As a result, the soil is now richer in organic matter. In upland regions, this provides direct benefits for 70,000 households. Soil degradation resulting from overuse and climate and environmental influences is declining, groundwater levels are rising, and there is more water available at the surface for micro irrigation. Small-scale farming is now more productive and better equipped for climate change. From 2010 to 2014, the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) is also supporting a German-Ethiopian advanced training centre for agriculture, which will provide instruction for experts in modern and sustainable agricultural production methods.

www.slmethiopia.info.et

PHOTOS: ALASKA STOCK/CORBIS (18); GIZ/URSULA MEISSNER (19); SOURCE FOR CHART: EUROPEAN COMMISSION, SOIL ATLAS OF THE NORTHERN POLAR REGION

Strategy that mining must 'follow the principle of sustainable development', and should therefore give equal weight to economic, environmental and social concerns. 'Environmental concerns include soil and water. So measures to protect these resources form part of current German partnerships with the raw materials sectors in Chile, Kazakhstan and Mongolia,' says Stefan Hoppe, who coordinates cooperation with the German Federal Ministry of Economics and Technology (BMWi) at GIZ's Berlin office. The Integrated Mineral Resources Initiative, implemented by GIZ in Mongolia on behalf of BMZ, also stipulates that consumption of natural resources should be minimised when extracting mineral resources. A key lever for resource protection is a sustainable and coherent legal framework for mining, which GIZ is helping to draft in Mongolia on behalf of BMWi. However, the focus here is not just on Mongolia's mining legislation, but also on relevant supplementary legislation dealing with oil, uranium, water and soil, since 'specific aspects such as water use have so far not received adequate attention within the framework of mining legislation,' says Hoppe. 'The objective is to develop a unified approach that pays equal attention to land management issues and to environmental, social and economic aspects.'

'The loss of soil resources through urbanisation and the conversion of our landscape is one of the major environmental challenges Europe is facing. (...) We simply cannot pave over our chances for a sustainable future.'

Janez Potočnik, European Commissioner for the Environment

It is a sensible approach, since the growing global population not only needs an ever increasing supply of industrial minerals, metals and oil; they also need increasingly efficient agricultural practices on ever more productive soils. This constant growth in demand is being fed by the emerging middle classes in the booming BRICS region (Brazil, Russia, India, China and South Africa) and in other developing and emerging economies. People are not just interested in cars, mobile phones and refrigerators, they are also consuming more meat and dairy products – foods which ultimately provide less in terms of calorific content than is actually required to produce them, when animal feed is taken into account. FAO studies show that meeting demand in global terms has functioned purely in arithmetic terms over the past 50 years. While agricultural land use has increased by 12%, yields have tripled thanks to more advanced production methods, and specifically as a result of increased yields in America, Europe and Asia. But by 2050, demand for food will have increased by another 60%, while available agricultural land per capita is on the decrease – from currently 0.22 hectares to less than 0.17 hectares, according to FAO forecasts. This will call for yet further increases in productivity if, for reasons of climate change mitigation, we are to prevent vital carbon sinks such as forests and moors from being turned into arable land.

Promoting sustainable forms of land management

'Improved land management must be our number one priority,' says Alexander Schöning, clearly stating GIZ's position. 'This means conserving land available for agricultural use on the one hand, and increasing land productivity on the other.' Good agricultural practices are considered the method of choice and are supported by GIZ on behalf of BMZ in various regions of the world. These practices include appropriate cultivation techniques, water management, erosion protection, appropriate and professional use of fertilisers, and properly adapted use of machinery. A special focus is placed on improving the sustainability of agricultural production systems. These may include such varied systems as conventional or organic farming, as well as conservation agriculture – a form of land management that permits the use of pesticides and mineral fertilisers, but dispenses with ploughing so that disruption to the land is minimal and topsoil is constantly covered with organic material. But there is no 'one-size-fits-all' solution, as the issue of fertilisers alone demonstrates. According to Schöning, 'To some extent, the reason the green revolution has been successful in Asia is because fertilisation recommendations have worked over large areas. In Africa, the land is much more diverse. In order to come up with effective fertilisation recommendations and improve yields there, we have to carry out soil analyses and draw up detailed soil maps – groundwork that should have been done decades ago.' Speed is now of the essence, since it costs more to rehabilitate soils that have already been depleted or destroyed than to improve soil management. GIZ promotes such measures at various levels, for example by »

PHOTO: SOUTHGOBI RESOURCES/AFP; SOURCE OF DIAGRAM: WORLD MINING DATA 2012, AUSTRIAN FEDERAL MINISTRY OF ECONOMY, FAMILY AND YOUTH

THE PLANET'S TREASURE STORE

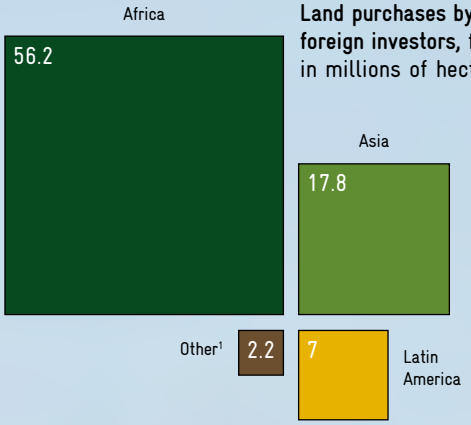
Global demand for metals and mineral resources from the ground is growing and extraction is steadily increasing. These extraction processes are permanently altering the soil structure and may give rise to waste products that pose a threat to the environment and to human health.

Worldwide mining production (not including diamonds) by continent, in billions of tonnes

INVESTMENT IN SOIL

Investors from industrialised countries and emerging economies are increasingly buying or leasing large areas of agricultural land in developing countries. The food and energy crops farmed there are mainly destined for export. Critics of this practice, known as land grabbing, complain that many small farmers will lose their livelihoods – because it either dispossesses them of traditional arable and grazing lands or inflates rents.

Land purchases by foreign investors, figures in millions of hectares



1) Mainly Eastern Europe and Oceania. Basis for all data: 1,217 published sales between 2000 and 2010.

advising partner governments on which sustainable land use strategies and support concepts make sense locally, by including manufacturers of seed or agricultural machinery into public private partnerships or by providing training for farmers.

'We can only achieve a world without hunger and poverty if we succeed in halting dramatic soil loss, learn to use our soil sustainably and start distributing it equitably,' stresses Klaus Töpfer. But land use is global, just as its current redistribution is global. Imports, which effectively involve virtual land use, are a rather less obvious form of this redistribution. The very fact that Europe has to import industrial raw materials for almost all manufacturing sectors because it cannot produce them – or not enough of them – is perhaps a characteristic feature of a global economy that is based on the division of labour. What should concern us more, however, is the fact that in order to meet its requirements for food, animal feed and other agricultural raw materials, Europe's imports account for twice as much land outside the EU than they do within its borders. This land can no longer be used to provide for local populations. It could be claimed at least that agricultural production generates a certain amount of value added through cultivation, processing and retail. However, the local population also loses out on this benefit if countries, enterprises and other investors choose to secure the land title to and process the soil itself rather than what it produces. And if disproportionately low prices are paid for the lease or sale of such land or the proceeds disappear into corrupt hands, then local people really are left with nothing.

Tricky balancing act

Any investment in land that lies outside one's own economic area naturally involves walking a tightrope between necessary investment in agriculture on the one hand, and a form of neocolonial land appropriation on the other. For this reason, the practice – which has been coined land grabbing – has made headlines in recent years. Although both the World Bank and FAO have issued guidelines on responsible investment in agricultural land, these guidelines are not binding. But the 'Land Matrix', which was presented at the World Bank's Land and »

EXAMPLES OF GIZ'S WORK › SOIL – A VITAL RESOURCE

Raw materials, mining, training, legislation

Commissioned by: German Federal Ministry for Economic Cooperation and Development (BMZ) and German Federal Ministry of Economics and Technology (BMWi)

MONGOLIA The German Government has teamed up with Mongolia to support its raw materials sector. The partnership was planned following close consultation between BMZ, BMWi and the German Federal Foreign Office.

As part of the Integrated Mineral Resources Initiative Mongolia, in 2010 BMZ commissioned GIZ to advise the partnership on overarching issues such as economic development, economic policy, private sector development and good governance to enable it to successfully control cyclical economic fluctuations brought about by the resource boom. GIZ's implementing partner in this programme is the Physikalisch-Technische Bundesanstalt (PTB), Germany's national metrology institute. German companies that wish to establish operations in the mineral resources sector in Mongolia, but would prefer not set up their own representations, can make use of the services provided by the programme's German Centre of Excellence, which include the leasing of office and exhibition space, recruitment of local staff and investment advice.

BMZ is also financing a project to support technical and vocational education and training in Mongolia, as well as a project to promote cooperation between German and Mongolian universities from 2014. Both projects focus on the raw materials sector.

BMWi awarded GIZ two further advisory contracts linked to the raw materials partnership between the German Government and Mongolia. These involve developing a sustainable and coherent legal framework and drafting an exemplary occupational safety strategy for mining. These contracts complement the approaches pursued by the BMZ programme Integrated Mineral Resources Initiative Mongolia.

GIZ ensures that the policy objectives of each of the two German ministries are achieved. For the Mongolian partners, having a single partner to perform implementation ensures that the overall advisory approach is consistent and coherent.

PHOTOS: JAN JOSEPH STOK (22); DIRK OSTERMEIER (23); SOURCE OF DIAGRAM: TRANSNATIONAL LAND DEALS FOR AGRICULTURE IN THE GLOBAL SOUTH – ANALYTICAL REPORT BASED ON THE LAND MATRIX DATABASE, APRIL 2012

Poverty Conference in Washington in 2012, shows that appropriate regulations are urgently required. Specifically, among the countries worst affected by land grabbing are seven of the poorest in Africa, where not even 1% of the yields from this land is sold on local markets. In developing the 'Land Matrix', GIZ and international research and development institutions systematically entered over 1,000 international land transactions for over 200 hectares into a database, and this work is still ongoing. The transactions evaluated to date cover around 83 million hectares of land, principally in Africa, where the area concerned is now roughly the size of Kenya. Key investors come from India, China, Malaysia, South Korea, Indonesia and the United Arab Emirates and usually pursue government commissions or private commercial interests.

A study published in parallel to the database suggests that the run on fertile land is not a short-term bubble but a long-term trend. The study claims that although interest is no longer as strong as directly after the height of the 2007/08 food crisis, the same driving factors are at work now as were then – global population growth and rising demand for food and energy. The problem is exacerbated by the fact that land grabbing and water grabbing are often two sides of the same coin. In other words, irrigation required for grabbed land leaves no water for the local population. Critics also complain that land grabbing often targets valuable, irrigable land with or without formal title which has good market access and is already used by small producers as arable or pastureland. Foreign direct investors in the country put these livelihoods at risk. Moreover, the World Agriculture Report published by the United Nations specifically highlights the potential of such small-scale farming structures. With appropriate support they could double food supplies in the region within ten years using climate-friendly production techniques and in so doing, help reduce rural poverty.

In response to the food crises and the dramatic increase in land grabbing since 2008, the United Nations last year officially endorsed the 'Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests'. Particular importance is attached in these guidelines to instruments which subject increasing investments in land and other natural resources to democratic regulation and scrutiny. After all, appropriate and secure access to these resources is one of the principal prerequisites for combating global poverty and hunger. For Arno Tomowski, Head of Portfolio Development Raw Materials at GIZ, it is a logical development: 'When it comes to dealing with land and with soil as a resource, it makes absolute sense to apply the same sort of standards that have proved reliable with extractive resources: good governance, transparency, and a properly functioning fiscal policy that leads to the reinvestment of state revenues in the infrastructure required for education and health. Only then will it be possible to enable investment in land – and consequently in soil – that is both legal and legitimate. And only then will we achieve fair and just land distribution and added value at the regional level.'

There are initial indications that the United Nations is keen to move not only land access but also soil conservation higher up the agenda. 'Without healthy soil, life on Earth is unsustainable,' said UN Secretary-General Ban Ki-moon on the eve of the 2012 UN Conference on Sustainable Development in Rio de Janeiro. If the FAO and its Global Soil Partnership achieve their objectives, World Soil Day, which has been celebrated on 5 December for the past ten years, will this year be added to the official list of UN days of action. And 2015, the International Year of Soils, will be dedicated exclusively to this vital natural resource. And perhaps by then, international agreements will have secured the ground beneath our feet – and in so doing the resource that gives our planet its name. ■

'Truly, it is the soil which makes the world a friendly environment for mankind. It is the soil which nourishes and provides for the whole of nature; the whole of creation depends on the soil, which is the ultimate foundation of our existence.'

Friedrich Albert Fallou (1794–1877), German geologist, soil scientist and lawyer

PHOTOS: DAN SAELINGER/GETTY IMAGES/UPPERCUT (25 TOP LEFT); SIMONKR D.O.O./ISTOCKPHOTO (25 TOP RIGHT); MOPIC/FOTOLIA (25 BOTTOM LEFT); MAX DIESEL/FOTOLIA (25 BOTTOM)

SOIL IN FIGURES

An average soil sample contains:

45% MINERALS

25% WATER

25% AIR

5% ORGANIC MATTER

SOURCE: EUROPEAN COMMISSION, SOIL – A KEY RESOURCE FOR THE EU, SEPTEMBER 2010

Vaduz, Liechtenstein has the highest per capita rate for soil sealing in Europe at 250 m^2 for each inhabitant. The lowest rate, at around 40 m^2, is found in Tirana, Albania.

SOURCE: EUROPEAN ENVIRONMENT AGENCY, WWW.EEA.EUROPA.EU/ARTICLES/URBAN-SOIL-SEALING-IN-EUROPE

10,000 soil types have been identified by experts in Europe alone.

SOURCE: EUROPEAN COMMISSION, SOIL – A KEY RESOURCE FOR THE EU, SEPTEMBER 2010

Soil captures about 20% of the world's man-made CO_2 emissions.

SOURCE: EUROPEAN ENVIRONMENT AGENCY, WWW.EEA.EUROPA.EU/SIGNALS/SIGNALS-2010/SOIL
››› ENVIRONMENT FACT SHEET: SOIL PROTECTION

500 years is the length of time it can take for two centimetres of topsoil to form.

SOURCE: EUROPEAN COMMISSION, SOIL – A KEY RESOURCE FOR THE EU, SEPTEMBER 2010

»Outside view

HELON HABILA

Land is a Limited and Diminishing Resource

Every time I return to Nigeria and travel across country by road to my hometown in the North East, I am amazed at how much and how fast the landscape has changed. Last year I took my children home for the first time, and as we drove through this same landscape, I saw it afresh through their eyes: the denuded scrubland running for miles with hardly a single tree in view, broken only by a mountain range in the far distance. I felt robbed, as if something that belonged to me had been taken away irretrievably. I recalled traveling on this same road with my father over thirty years ago and seeing farmers standing by the roadside with quails and guinea fowl and deer that they had shot and wanted to sell. The memory of how this land used to be had shielded me from acknowledging the starkness and the extent of the change. But now everything lay bare, unmitigated by memory.

It wasn't always like this, I wanted to tell my children, there used to be deer and streams and rabbit and wild fowl in this barren place.

Years ago, the Kenyan environmental activist and Nobel Prize winner, Wangari Maathai, protesting the Kenyan government's decision to dig up a large portion of Uhuru Park in the centre of Nairobi to replace it with office buildings and statues, said, 'When I see Uhuru Park and contemplate its meaning, I feel compelled to fight for it so that my grandchildren may share that joy and that freedom as they one day walk here.' Maathai led a protest and was thrown in prison, but eventually, with the help of international organizations and the media, she was able to win her fight.

A lack of idealism

Politicians don't care very much for environmental issues. They can talk about it, they can run on environmental platforms, but the truth is they'd rather build office buildings or erect giant statues or erect a Berlin wall than build parks – parks cost too much money, they have to be maintained and paid for, they don't always generate revenue.

In my second novel, *Measuring Time*, I try to illustrate this glaring pragmatism and lack of idealism with the anecdote of a politician who promises his constituents that, if voted into office, he would turn their drought stricken land green. He would do this by a process called reverse osmosis. He would sink pipes into the faraway Atlantic and pump water hundreds of miles back to the hinterland. The water would

› PROFILE

Helon Habila was born in Nigeria in 1967. He is a novelist, poet, and short story writer. He teaches creative writing in the USA. His current novel, *Oil on Water*, focuses on the environment and the violence that accompanies oil extraction in the Niger Delta. Here he talks about why we need to rethink how we use land.

PHOTOS: ANKE KLUSS

be desalinated and used to form artificial rivers and lakes, and presto, everything would turn green. It is a dazzling prospect, one that reads well in the papers but one that, alas, the politician fails to deliver on. This anecdote sums up in many ways the situation of land use, or land misuse in Nigeria, and I am sure in many countries as well. We take land for granted. We take and take, and we never remember to put back, till one day the green and verdant landscape of our childhood has been replaced by this denuded moonscape, and it is never easy to turn back the clock.

Nigeria is the most populous African country, and currently the population stands at over 160 million people. In 1990, about 82 million hectares out of Nigeria's estimated 91 million hectares were arable. 42% was in use. About 20 million hectares were covered by forests and woodlands and 19 million covered by buildings. But all that has since changed, in 1990 the population was under 100 million, now it has almost doubled.

This population is urbanising rapidly, placing more stress on available land in the cities. In Lagos, the most populous Nigerian city with over 15 million people, and where it is estimated that over 30,000 souls come every day to begin a new life, land is even more of a premium. People sleep in car parks and under bridges and on the beaches, and side by side with these deadbeat souls are the super rich, living on acres of property, their houses covered by tall walls and barbed wire.

In the rural areas the land is becoming exhausted and useless. In the north of the country, which lies on the southern fringe of the Sahara, desertification is pushing the population more and more southward. As the land available to sustain livelihood diminishes, the level of tension and violent conflict increases.

I wonder if anyone has made this simple connection: that the rise in violence in Nigeria, often blamed solely on religious fundamentalism in the north and on oil extraction activities in the Delta, may have links to the poor choices we make over land use? Last year I was in the Niger Delta on a journalism assignment. I visited the creeks and villages tucked away in the marshes and hidden by mangrove swamps. These places, before the discovery of oil in 1958, used to be famous for their abundance in palm oil and fishing and logging, but since the arrival of the oil companies, and the virtual take over of the land by these companies for oil prospecting, agriculture has been pushed to the margins, virgin forests have been laid waste to be replaced by drilling rigs and oil pipelines.

People wish to return to the past

When I asked the villagers if they considered oil a blessing or a curse, they said it was a curse, and they wished they could return to the bygone days when there were fishes in the sea, and they could plant their crops in peace.

The point here is that the government in its quest for more income has prioritized oil extraction over everything else, and the result is oil slicks, and gas flaring, and acid rain, and violence. But it is clear that what the affected communities need to do is what the people of Ogoni community did when they discovered many years ago that Shell was destroying their environment. They decided to kick Shell out of their community, and up to now, as far as I am aware, Shell does not operate in Ogoniland. There are some things, like land use and land control, that are too important to leave in the hands of a government alone.

What further complicates the issue of land use in Nigeria are the many changes in land use law since independence. In the pre-colonial days land was managed communally, mostly for farming, under the immediate control of family groups, and passed on from generation to generation. Then came the colonial government, and control and distribution of land was taken away from the communities and family heads and transferred to the colonial administration. The main aim of this change was not to protect the land and maximize its potential, but mainly to generate revenue. In 1978 the current land use decree was enacted. Now an individual can buy land, and can develop it and have the use of it for a certain number of years, but he does so under the supervision of the State government. But this change has not really simplified things as one might hope. Whenever a natural resource is commoditized, the competition to own it gets fierce, and if that resource happens to be limited and nonreplicable, the competition can become deadly.

Land is a diminishing resource not only in Nigeria but everywhere. As the global population increases daily, and as the land available to all of us shrinks, it is unwise to leave the custodianship of it in the hands of politicians alone. We must all speak up so that alongside office buildings and statues and oil rigs, there will also be parks and rivers and lakes to pass on to our children. ■

MOVING FORWARD

ON THE OUTSKIRTS of Delhi, where only yesterday there was still grazing land for sheep, high-rise apartment blocks are going up overnight, dramatically altering the cityscape. India's social and economic transformation is abrupt, with no room for a slow transition. Some people's place in the future is unclear. The herders are unlikely to move into the new apartments, whose future occupants will have shrugged off much of India's traditional lifestyle. In India and other emerging and transitional countries, GIZ is working on behalf of the German Government to support comprehensive change processes. **Photo:** Murali Nair

Sustainable cotton growing offers new prospects for farmers in several African countries.

STABLE DEMAND

The 'Cotton made in Africa' (CmiA) quality label stands for sustainably produced cotton from African countries. With training from CmiA, smallholder farmers are learning how to grow cotton successfully – and how to protect themselves from world market price volatility at the same time.

Text Peter Seidel

It's five o'clock in the morning in Sinoya, a village in Katete District in eastern Zambia. Solobat Phiri leads two oxen out of their pen at the edge of his farmyard and yokes them up to a simple two-wheeled cart. His plough is already stowed in the back. Last night, it rained heavily, for the first time in a long time. The downpour only lasted half an hour but it was enough to allow 42-year-old Phiri and his two daughters Veronica (16) and Helen (14) to take the plough out to the field and start sowing cotton. It's a good 20-minute walk. The farmer sets to work. His two daughters guide the oxen up and down the field, one to the right, one to the left, keeping them on track.

Solobat Phiri is a successful cotton farmer. From 2010 to 2011, when he had one hectare of land under cotton, he was able to boost his yield by 350 kilos, to a total of 2,150 kilos. This success was due in no small part to the training he – and around other 180,000 Zambian cotton farmers – received from the Competitive African Cotton Initiative (COMPACI), which works with cotton growers in several African countries. At COMPACI's Cotton Schools, farmers learn how to apply modern and efficient growing methods, including the careful use of pesticides, based on the principle of damage thresholds. This means that certain pesticides are not used until a specific number of pests or infected plants are identified on a designated small area of the field. In other words, the pesticides may not be used preventively. The right way of applying fertilisers is also part of the curriculum: 'With cotton, you mustn't apply the fertiliser to the earth directly around the plant; it mustn't be too close. Otherwise, you do more harm than good,' Phiri explains.

2011 was also a successful year for Phiri's business because the price of cotton on the world market soared to unprecedented levels. The purchase price agreed with the cotton ginning companies for 2011 was 3,200 Zambian kwacha (approx. €0.46) per kilo. After deducting the costs of fertilisers, pesticides and additional workers to help in the fields, Solobat Phiri and his wife Tiku pocketed almost €710 in pure profit from the sale of their cotton to cotton ginning company Cargill Zambia Ltd.

Cotton

Cotton is arguably the world's most important natural fibre. 300 million people work in cotton growing worldwide. From cotton field to ginning, spinning, weaving, dyeing and designing to retail: as many as 850 million people all over the world are employed in the value-added chain in roles that have at least partial relevance to the processing and marketing of cotton.

Smallholder farmers in sub-Saharan Africa produce around 1.2 million tonnes of cotton, amounting to 12% of global output. The most important cotton growing countries are India, China, the USA and Pakistan, which produce three quarters of the seven to nine million tonnes of cotton traded globally each year.

However, only around 2.5% is produced in accordance with sustainability standards. The growing demand for sustainably grown cotton offers opportunities for African farmers, but there are problems: besides commodity price volatility, the value-added chain is based on a global division of labour, so making a clear and consistent distinction between sustainably and unsustainably grown cotton is only possible at considerable cost.

Spurred on by this success, Phiri expanded his cotton growing area to almost 1.3 hectares and was able to increase his yield per hectare yet again, this time to 2,776 kilos. Indeed, his total harvest in July 2012 was 3,610 kilos of cotton. But the world market price of cotton crashed, and Cargill paid just €0.23 per kilo. In autumn, Phiri was left with a profit of just €470. Even so, without the skills acquired at Cotton School, which enabled him to expand production and increase his yield, his 2012 profit would have fallen even further.

World market price volatility: creating insecurity

For Phiri – and thousands of other Zambian cotton farmers – the volatility of the world market price was disappointing. Since then, prices have started to rise again, but the ups and downs are always a talking point.

Nonetheless, Phiri is in a strong position compared with many other farmers. As well as having enough land, he has draught animals to help him till his fields, so that besides cotton, he can produce enough maize and groundnuts to feed his nine-member family. In his vegetable garden, he also grows sugar cane, onions, squash and other produce which he can sell at the market.

According to Frans Grey, Cargill Zambia's country manager, Phiri is certainly on the right track. 'We tell the farmers that they need to diversify and not just rely on cotton and maize,' he says. Zambian farmers generally have around 1.2 hectares under cotton, amounting to around one third of their cropland. At Cotton School, they learn how to boost their yields, not only of cotton but also of maize, groundnuts, onions and squash. Cargill pays for the fertilisers and pesticides for cotton growing, and the farmers can now use them to grow other crops as well – for after the collapse in cotton prices in 2012, Frans Grey expects the Zambian cotton farmers to reduce the amount of cotton they sow by as much as 40%.

Roger Peltzer, Project Director for the Competitive African Cotton Initiative at the Deutsche Investitions- und Entwicklungsgesellschaft (DEG) in Cologne, is not »

PHOTOS: AID BY TRADE FOUNDATION (30); LI JINGWANG/ISTOCKPHOTO (31)

❶ The cotton undergoes initial sorting in the fields. ❷ The mills spin the bales of cotton into yarn many metres long. The grade and quality of the cotton are constantly checked during spinning. ❸ The cotton is wound onto large bobbins and is now ready for the next stage of processing, namely weaving.

quite so pessimistic. Together with GIZ, DEG is responsible for managing the German Development Ministry's contribution to the initiative. But he too is predicting a decrease in cotton growing in Zambia.

Nevertheless, Cargill's country manager Frans Grey points out that despite the fluctuating commodity prices, the number of Cotton Schools has increased from 560 to more than 2,100 since 2009. And that's not all: since joining the Competitive African Cotton Initiative, Cargill has also been supporting a steadily growing number of Cotton Women's Clubs – groups of women who cultivate a jointly managed field and attend weekly meetings where, like the men, they undergo training in sustainable cotton growing methods. 'Women often feel intimidated when men are present. But women carry out four fifths of the work in the fields, so we think it is important to ensure that they are properly trained. And women make better farmers.' Frans Grey's comments are short and to the point.

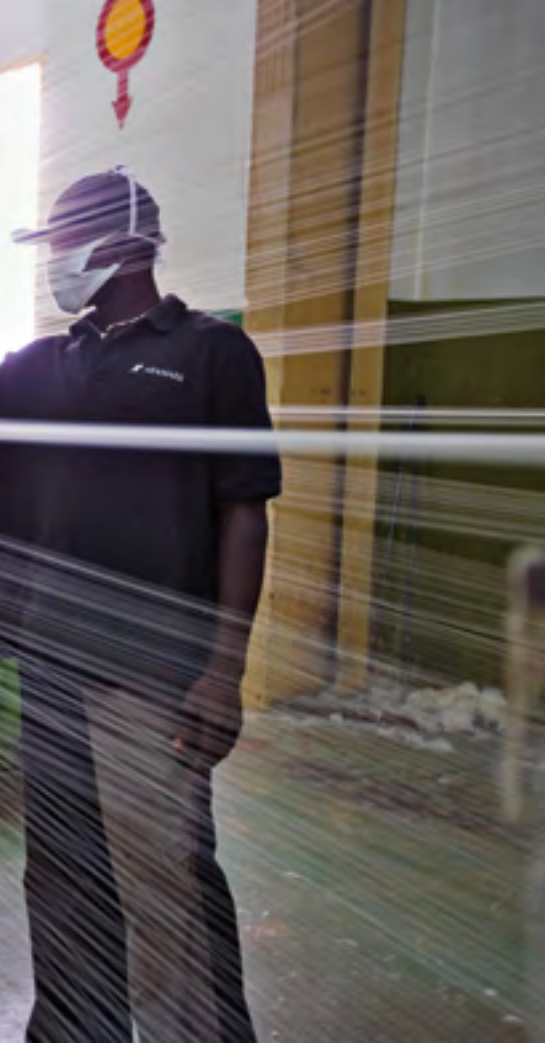
And indeed, compared with their menfolk, women are often quicker to apply the sustainable growing methods that they have learned at Cotton School. Cargill advisors report, for example, that the women are adept at using the ripper, which produces a shallow depth of tillage and thus minimises soil disturbance compared with a traditional plough. Male farmers, by contrast, are proving slow to adopt this technology.

Sustainable growing methods

Kennedy Kanenga from the Zambia Agriculture Research Institute (ZARI) has also noticed that even after years of training, farmers are slow to adopt modern growing methods. Even so, he is convinced that they are on the right track. In his view, their traditional rain-fed agriculture and crop rotation already provide a sound basis for sustainable cotton growing.

At present, the training for the farmers is part-funded by the partners involved in the Competitive African Cotton Initiative, including the German Aid by Trade Foundation (see box on next page). Over the long term, however, the Foundation will cover the costs of training from revenue from the licence fees paid by clothing companies to the Foundation in return for the right to produce garments labelled 'Cotton made in Africa'. In 2012, some 20 million garments were made from 'Cotton made in Africa' and sold in the market, and for 2013, the initiative expects this to increase to 24 million garments.

In order to further improve the marketing opportunities for sustainably grown cotton on a long-term basis, the Competitive African Cotton Initiative and 'Cotton made in Africa' entered into a partnership with the global Better Cotton Initiative in 2012. The Better Cotton Initiative pursues similar goals and is backed by global retailers such as IKEA, H&M and Levi Strauss. According to Roger Peltzer from DEG, this will greatly facilitate clothing companies' and retailers' access to sustainable cotton, and, as



a result, will permanently improve the living conditions and prospects of hundreds of thousands of smallholder farmers in sub-Saharan Africa.

While the two sustainable cotton initiatives focus on further increasing the demand for African cotton, Solobat Phiri from Sinoya in eastern Zambia will continue to work his cotton field, weeding, applying fertiliser and keeping an eye out for pests. 'Growing cotton is hard work,' he says, and laughs. If everything goes to plan and this summer's harvest is a good one, he intends to put most of the profit aside for his two older daughters, so that they can continue to attend high school. ■

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PHOTOS: AID BY TRADE FOUNDATION

› AFRICA

'Cotton made in Africa'

With the 'Cotton made in Africa' initiative, launched by Hamburg-based businessman Michael Otto in 2005, the Aid by Trade Foundation has successfully mobilised a steadily growing group of German and international clothing companies in support of sustainable cotton growing in sub-Saharan Africa. The clothing companies undertake to purchase the cotton, which is produced for the world market in compliance with sustainability and social standards, and pay a licence fee for the right to use the 'Cotton made in Africa' quality label. The revenue from the licence fees pays for agricultural training for African farmers, who learn how to apply effective and sustainable growing methods in accordance with the initiative's criteria; it also pays for verification of compliance with CmiA's cotton growing standards. In cooperation with corporate partners, cotton ginning companies and the public sector, the Aid by Trade Foundation is also investing in social projects, focusing, for example, on education and women's advancement. 'Cotton made in Africa' is supported by the international Demand Alliance and a large network of partners who, from the outset, have included not only the clothing companies but also the German Federal Ministry for Economic Cooperation and Development (BMZ), DEG and GIZ.

www.cottonmadeinafrica.org/en
www.giz.de/themen/en/23283.htm

Competitive African Cotton Initiative

Building on the positive experience gained with 'Cotton made in Africa', the Bill & Melinda Gates Foundation and the German Federal Ministry for Economic Cooperation and Development (BMZ) launched the Competitive African Cotton Initiative (COMPACI) in 2008 and substantially increased the number of participating countries and farmers. GIZ and the Deutsche Investitions- und Entwicklungsgesellschaft (DEG) were commissioned to implement the programme. The Gates Foundation will provide total funding of almost US$41 million to 2015, with a further US$25 million coming from BMZ and US$6.5 million from the Aid by Trade Foundation. Private companies operating in Africa are contributing a substantial share of the funding – more than US$60 million. By early 2013, almost 490,000 farmers in Benin, Burkina Faso, Côte d'Ivoire, Malawi, Mozambique and Zambia were participating in the programme. Ghana, Cameroon and Tanzania also plan to join the initiative. The target is for 650,000 farmers to have increased their output of cotton and food crops by the end of 2015, thus boosting their income from agriculture. As well as providing training for the farmers in growing methods and business skills, the programme facilitates access to microcredits and supports women and cooperatives. At the end of 2015, all the various donors, with the exception of the Aid by Trade Foundation, will pull out of the programme. The Foundation will then be solely responsible for supporting the African partners with social projects, training and verification of cotton, paid for from the licence fees received from the use of the 'Cotton made in Africa' label.

www.compaci.org