SETTING COURSE FOR A SUSTAINABLE WORLD

How to secure food security under land, water and energy stresses

Natural resources are becoming increasingly scarce: A growing and more affluent global population has a higher demand for land, water and energy. At the same time, due to climate change and other human-induced factors, the resources we rely on for food are actually shrinking. In the future, we will have to produce more with less – and we will have to do so more sustainably and in a way that enables the poor to realize their right to adequate food.

LAND

Cultivated systems cover 25 percent of the land on our globe. A 10-20 percent increase may be needed to meet growing food demand. At the same time, demand for nonfood agricultural products (feed, fuel, fiber) could push the need for land even higher. This expansion will affect other ecosystems – particularly biodiversity.

ENERGY

If current policies continue, the oil price might rise from US$78 in 2010 to US$140 in 2035. High energy prices will increase the costs of inputs, water, transportation, marketing – and consequently the price for food. At the same time, using land for the production of fuel rather than food will become more and more attractive to farmers.

WATER

Agriculture consumes 80 percent of the world's "blue water" and is therefore both vulnerable to water scarcity and a contributor to it. Economic growth will increase the demand even further: urbanization comes with a change of people's lifestyles, relying heavily on more water-intensive diets (meat, milk, vegetables).

RESPONSIBLE GOVERNANCE OF LAND
Small-scale farmers feed the majority of the world, producing food for 70 percent of the population. If priority is to be given to food security, traditional land rights of local farmers must be secured.

PRESERVATION
Reforestation and soil fertility management help preserve biodiversity. Efficient use of natural resources could reduce the number of malnourished children from 115 to 50 million by 2050.

SUSTAINABLE INTENSIFICATION
Site-specific agro-ecology surpasses large-scale industrial farming in terms of global food security. Low-input techniques that conserve resources were found to increase productivity by 79 percent.

AGRICULTURE PRIORITIZING FOOD SECURITY
The production of 100 liters of bioethanol requires 230 kg of corn. This means that two tanks of bioethanol are equivalent to one person's calorie needs – per year. Instead of subsidizing biofuel, priority should be given to food production.

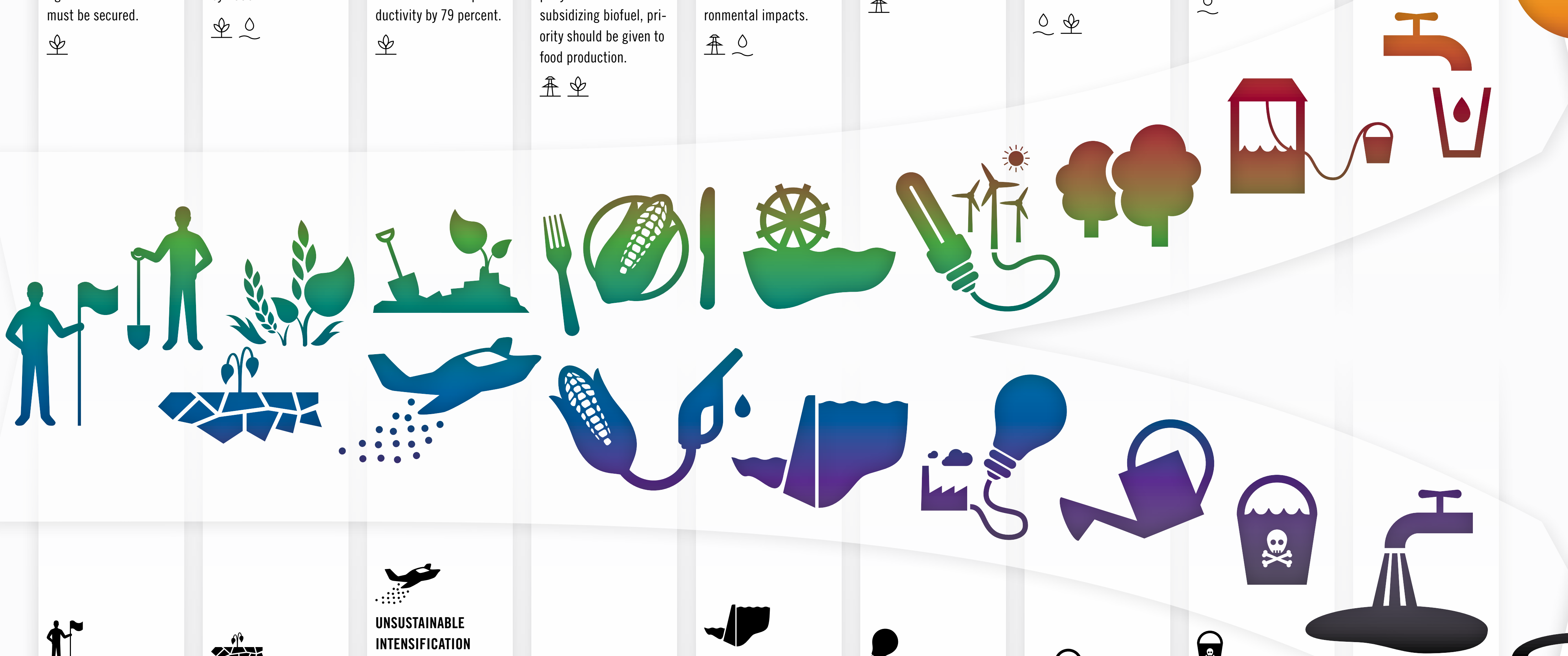
INTEGRATED USE OF HYDROPOWER
By 2050, hydropower could produce twice as much terawatt hours as today. The development, however, should not merely consider efficiency but also the socioeconomic and environmental impacts.

EFFICIENT AND SUSTAINABLE USE OF ENERGY
The manufacturing industry could save 34 percent of energy by 2030 by using the best technology available today.

INTEGRATED MANAGEMENT
Deforestation and access to land may be crucial for pasture. But forests can help moderate destructive flood and drought cycles – and hence minimize the risk of harvest losses.

SECURE ACCESS TO WATER
36 percent of the world's population lives in water-scarce regions. Increased investments could help provide safe drinking water to all people by 2050.

EFFICIENT USE OF WATER
If resources were used more sustainably, water withdrawals from the environment could be lowered by 1,369 cubic kilometers by 2050.



LAND GRABBING
In Cambodia, Sierra Leone and other countries land accounting for up to 50 percent of the agricultural area has been grabbed by investors producing for export. 55 percent of land deals relate to biofuel production.

DEGRADATION
Unsustainable agriculture leads to desertification, deforestation and soil erosion. According to estimates, 23 percent of all usable land has already been affected by degradation, reducing its productivity.

UNSUSTAINABLE INTENSIFICATION
If we want to minimize the conversion of natural land to cropland, thereby preserving biodiversity, intensification is key. However, high-input "blue-print" intensification with its runoff of fertilizers and pesticides affects public health as well as aquatic systems.

AGRICULTURE PRODUCING FUEL, NOT FOOD
Demand of primary energy might rise by one third between 2010 and 2035. High energy prices will make biofuel more profitable than food.

UNBALANCED USE OF HYDROPOWER
Development of hydroelectric power can lead to resettlements and the loss of freshwater ecosystems. Estimates suggest that 40-80 million people have been displaced worldwide as a result of dam constructions.

INEFFICIENT AND WASTEFUL USE OF ENERGY
The OECD countries use more than 8300 kilowatt hours on average per person – compared to 1900 kilowatt hours in Latin America and the Caribbean and 500 kilowatt hours in South Asia.

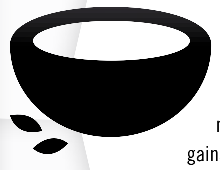
UNCOORDINATED DEMANDS
If industry and households continue to increase their consumption of water, it is likely that only 66 percent of irrigation water demands can be met by 2050.

UNCERTAIN ACCESS TO WATER
780 million people are forced to rely on unsafe water sources. Without access to safe drinking water, diarrheal diseases are likely to occur – a major source of childhood illness and death in the developing world.

INEFFICIENT AND WASTEFUL USE OF WATER
The average US-American citizen uses 575 liters of water per day, while a person in Uganda uses 15 liters.

THE SUSTAINABLE SCENARIO

If we find a new path that is based on a responsible and holistic use of land, water and energy, while also addressing the factors that contribute to natural resource scarcity, including climate change, we will create a world in which adequate access to food is provided for all.



THE CONVENTIONAL SCENARIO

If we carry on with our inefficient use of land, water and energy, while relying on uncoordinated policies and short-term gains, we will create a world in which trade-offs between natural resources and human well-being will lead to even less food security than today.

Sources: Global Hunger Index (GHI), United Nations Environment Programm (UNEP), Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV), International Energy Agency (IEA), UN Industrial Development Organization (IDO)