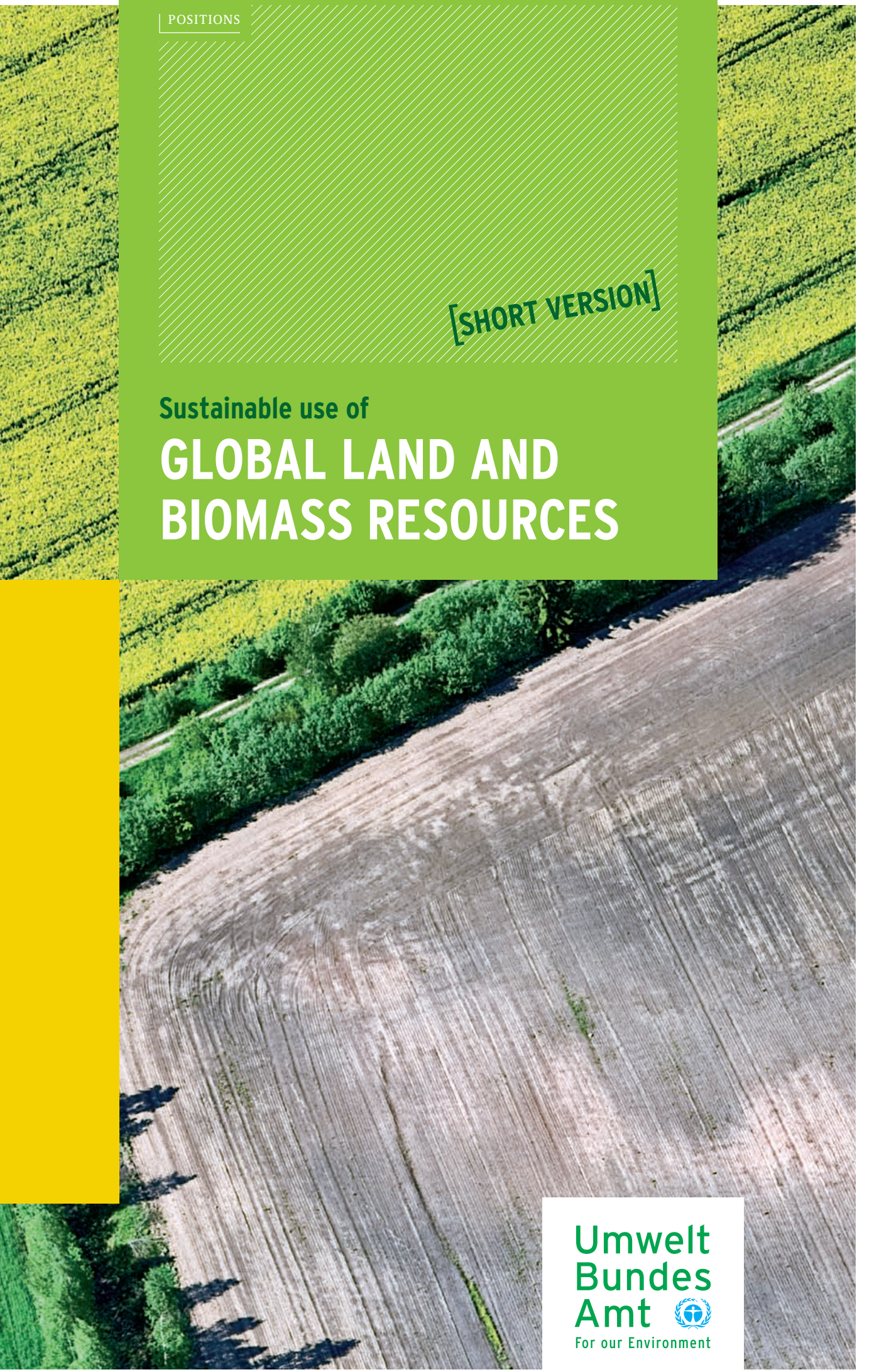
POSITIONS

[SHORT VERSION]

Sustainable use of

GLOBAL LAND AND BIOMASS RESOURCES



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E-Mail: pressestelle@uba.de
Internet: www.umweltbundesamt.de

facebook.com/umweltbundesamt.de

Authors:
Almut Jering, Anne Klatt, Jan Seven,
Knut Ehlers, Jens Günther, Andreas Ostermeier,
Lars Mönch

as well as
Kora Kristof, Carla Vollmer, Katja Purr,
Gertrude Penn-Bressel, Dietrich Schulz,
Simone Richter, Gudrun Schütze, Matthias Wolf,
Andreas Burger, Michael Golde, Jeannette Pabst,
Reinhard Herbener, Frank Wetzel,
Andrea Fechter, Katharina Koppe,
Gunnar Gohlisch, Nadja Richter,
Steffen Matezki, Konrad Raeschke-Kessler,
Christopher Blum, Friederike Herrmann,
Uwe Volkgenannt

Editor:
Almut Jering, Section I 1.1, Sustainability
Strategies, Resource Protection

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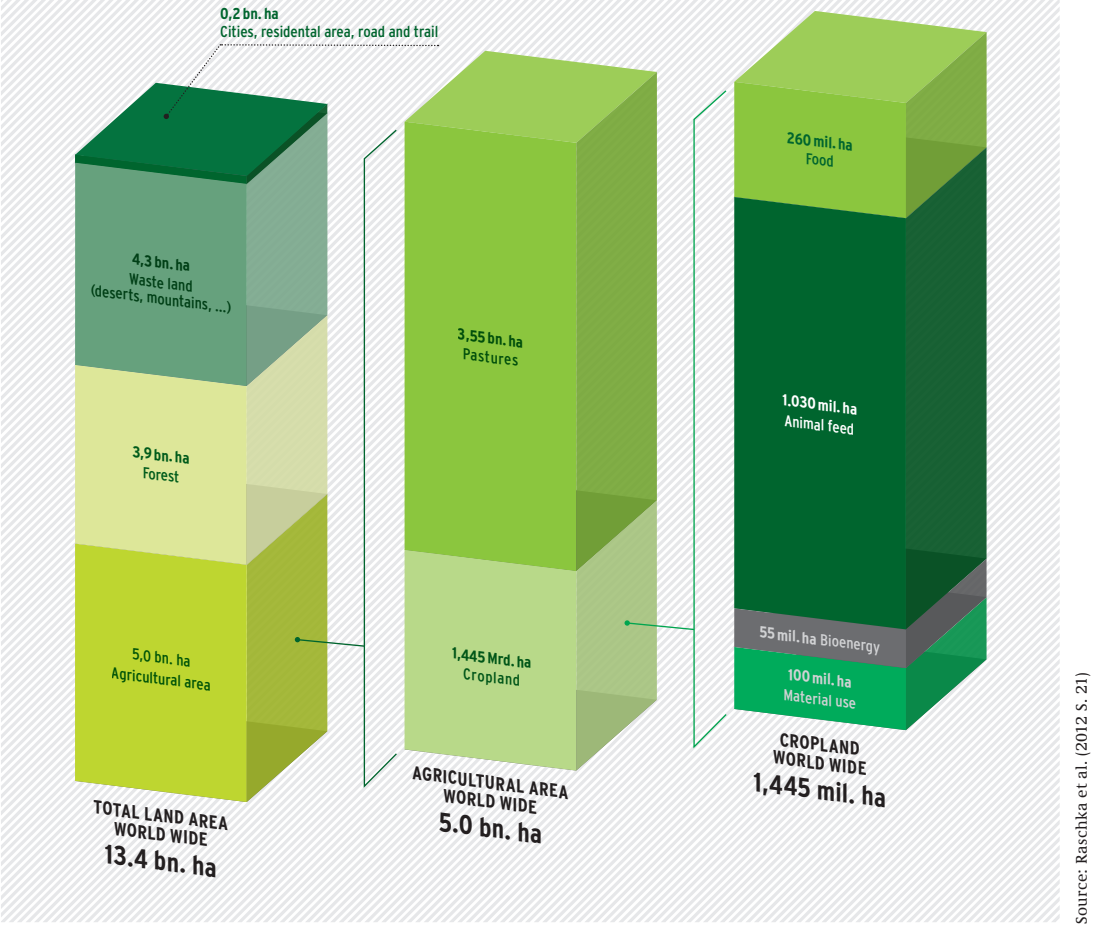
SUSTAINABLE USE OF GLOBAL LAND AND BIOMASS RESOURCES

The UBA position paper “Sustainable Use of Global Land and Biomass Resources” provides an overview of the current status of land use for biomass production. The term biomass is here understood to encompass all agricultural and forest products as well as their residues and the respective waste materials, i.e. all land-based biomass. Aquatic biomasses are explicitly excepted.

The position paper highlights existing and likely development trends. It outlines paths and key courses of action for more environmentally sound and socially fairer resource use and makes policy recommendations for the development of sustainable, resource-saving global land and biomass use. It looks primarily at the global perspective and the issue of global land availability.

FIG. 1: **Global land use for food and renewable raw material production 2008**



Source: Raschka et al. (2012 S. 21)

Of the 13.4 billion ha global land surface around 3.9 billion are covered by forests, and around 5 billion ha by farmland. The farmland is divided into 3.55 billion ha of pastureland and 1.45 billion ha of arable land. Globally, the volume of crop- and pastureland increased by 154 million ha (approx. 3 %) between 1985 and 2005. These increases occurred mainly in the tropics, whilst the respective areas decreased in the temperate zones (Foley, et al., 2011).

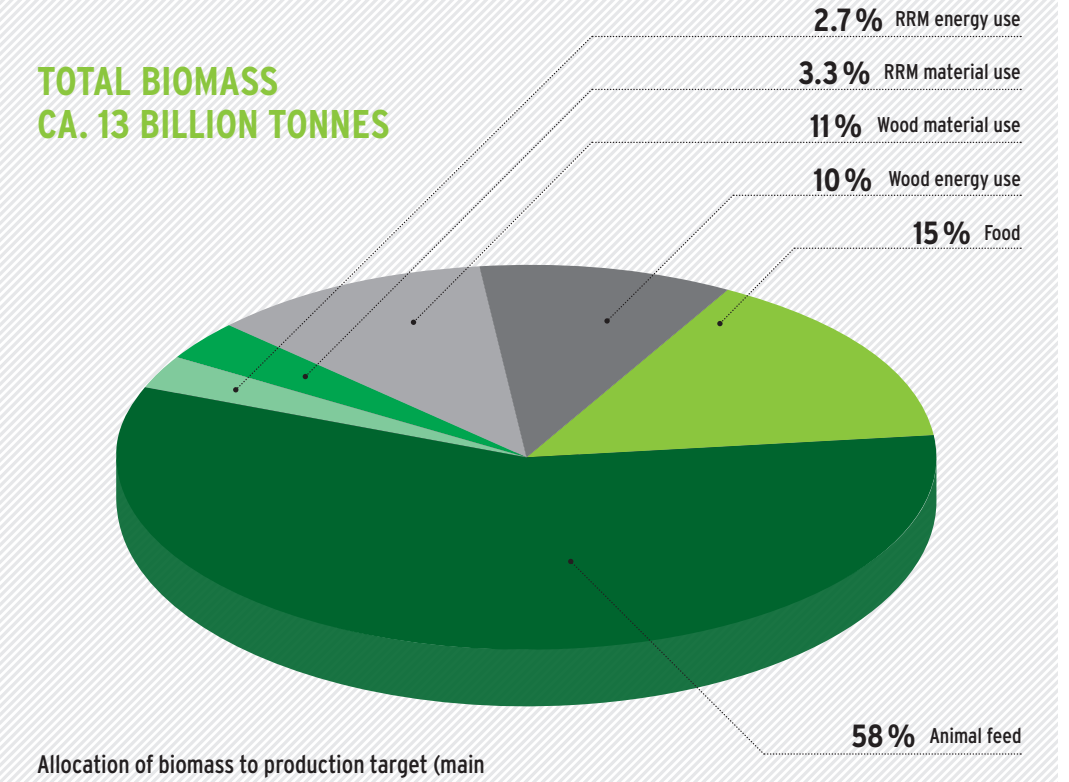
Worldwide, around 30 % of the land surface is covered by forests. Roughly equal volumes of these forests are exploited for industrial timber (2 billion ha) or the extraction of fuel wood (1.9 billion ha). Between 1990 and 2010, global forest losses amounted to 135.2 million ha (FAO, 2011), or 3.2 % of the global forest cover in 1990.

The worldwide biomass volume produced by means of agriculture and forestry amounts to 13 billion tonnes (Raschka et al, 2012). Most of this (58 %) is used as fodder, a mere 15 % of the entire biomass grown is plant-based food for human consumption. Around a third of the biomass cultivated is used as a renewable raw material (particularly wood) for energy generation and to supply industrial feedstock (see Fig. 2).

Worldwide, biomass currently supplies approx. 50 exajoules (EJ) of energy, which is a good 10 % of the primary energy used globally. The most important bioenergy carrier is firewood. However, biomass not only provides food, feed and fodder, energy or industrial feedstock; it also has a range of ecological functions, for example as a habitat or a carbon sink.

FIG. 2:

Use of agricultural and forest biomass harvested worldwide



Allocation of biomass to production target (main product). Respective amounts include raw materials and by products, even if their use fall into a different category.

RRM = Renewable Raw Materials

Source: Raschka et al. (2012)

Land and other natural resources for the production of biomass are subjected to increasingly fierce pressure due to the rising worldwide demand for agricultural produce and forest products. Important drivers of this problematic issue are a growing demand for essential material goods through the increasing number of people, the sustained resource-intensive consumption patterns of the industrialised countries and their extension to the newly industrialising countries. Along with the rising incomes, the per capita claim on resources in some newly industrialising countries is slowly reaching the level of the earlier industrialised countries, although there is still a clear divide.

The ecological and socio-economical consequences of this spiralling demand are diverse. In many places, they exacerbate the critical state of the productive and regulative function of global ecosystems, even though the achievement of one of the central goals of Sustainable Development – the permanent eradication of the persistent hunger in some regions of the world – is nowhere in sight. More than 1 billion people continue to suffer from malnutrition and hunger.

The strongly fluctuating agricultural product prices, the increasing value of fertile land and agricultural commodities as speculation objects in the recent past, the price-related hunger crises in 2007 and not least, the land grabbing phenomenon are indicators of the amplification of this problematic issue and, at the same time, highlight the urgent need for action.

On the one hand, the emerging quantity challenge can be met by pursuing an increase of the supply, and on the other, through a more

efficient and needs-oriented use and distribution of the available volumes of agricultural produce and forest products (combating hunger). One fundamental challenge in the process of increasing biomass availability to cover the growing demand are the frequently concomitant negative environmental impacts up to a destruction of the long-term productivity of the agricultural and forest systems, which is absolutely contrary to the intergenerational component of the guiding principles of Sustainable Development.

If an increased supply is pursued by means of farmland extension, this is often done at the expense of other protected goods, above all of biodiversity, and the valuable ecosystems essential for climate regulation, for example. The pressure on these forested areas is threatening to continue to increase, whilst the cessation of deforestation and its reversal must remain one of the central global environmental goals. The renewed use of marginal and degraded land is also not non-objectionable per se.

High environmental costs can be the consequence of an intensification of the production to increase land productivity if this is not done under consideration of the respective agricultural and forest system‘s capacity for bearing ecological burdens and its buffer capacity. Nitrous oxide emissions, contamination with pesticide residues and the eutrophication of the soil, the air and bodies of water, diverse forms of soil degradation such as the depletion of organic carbon, salination, loss of the fertile topsoil through erosion, loss of (agro) biodiversity, and a growing scarcity of agriculturally usable water resources are just some of the symptoms that can be associated with non-sustainable production increase and agriculture expansion. Intensified forest exploitation also harbours risks, such as negative nutrient balances and the loss of the forests‘ carbon sink function.

The ecological compatibility of the requisite increased agricultural and forest production in areas where land yield can still be improved is one of the most important tasks for the international environmental, agricultural, trade and development policies. Particularly soil protection ought to be given a considerably higher priority than is currently the case as fertile soil is the key resource for agricultural production. This also applies to the intensive farming systems in the industrialised countries, where cultivation methods that are accompanied by high environmental costs should be replaced

with low(er)-emission, more soil and water resource friendly farming methods. Locally adapted organic farming methods will have a key role to play in this.

Beyond the supply-oriented steering approaches, the use and distribution of agricultural and forest goods must be fundamentally reviewed and realigned. Wherever consumption patterns are associated with a disproportionately high claim on the available land and resources, changes must be initiated. If, for example, the normal local diet features a very high proportion of meat and other animal products, the increase of the proportion of plant-based food should be pursued. The containment of the losses in the food production-consumption chain is another relevant, ethically non-objectionable starting point for demand reduction. To mitigate usage conflicts with regard to the use of biomass for food, industrial purposes and energy generation in order to use the available biomass as efficiently as possible, regulations must be developed and implemented to ensure a cascading utilisation of biomass. The use for energy generation must be the last stage.

The cultivation of biomass for energy generation as a contribution to covering the high energy consumption in the industrialised countries demands disproportionally extensive areas of productive farmland. With wind and solar energy, more efficient alternatives in terms of area yield with a more relevant total potential are available, or at least they are in Germany.

> Consumption patterns associated with a disproportionately high claim on the available land and resources, must be changed.

The problematic issue of their fluctuation cannot be fully compensated by bioenergy, due to the extremely limited energy potential of cultivated biomass. E.g. alternative storage and load-balancing technologies such as ‚power-to-gas' must be developed in any case. In the transport sector, biofuels can again cover only a marginal proportion of the total demand, and this is accompanied by a full awareness

of the ecological and social-economical risks, including ‚indirect land use changes'. Biofuels should therefore be relied on only where a replacement of fossil fuels with less objectionable technologies such as, for example, electric drive systems, hydrogen fuel cells or wind and solar power based e-methane is not (yet) in sight.

Particularly soil protection ought to be given a considerably higher priority, as fertile soil is the key resource for agricultural production.

In the southern countries, on the other hand, the use of biomass to generate energy currently represents the only means of access to energy. These regions still harbour an extensive potential for efficiency increases and a reduction of the damage this traditional use inflicts on the environment and the health of the local population whose exploitation is worth supporting.

The guaranteeing of ecological and social minimum standards for the supply of agricultural produce and forest products by means of an adequate and functioning certification system is one way of making a valid and important point in terms of production. However, extremely challenging preconditions are required for certification to be effective. Its reach and effectiveness are clearly limited, and as a tool, certification also harbours risks, above all if the respective criteria are ill-defined or not implemented to the required degree. Certification should therefore not be overrated.

International trade law should be reformed in such a way as to support ecological and social minimum requirements, rather than hindering their implementation.

The effective reduction of hunger and a prevention of the dangerous price peaks on the agricultural markets calls for improved institutions and framework conditions. International policy-makers must not least address the destructive variants of food speculation and the problematic issue of land grabbing. In this respect, increasing the rights of smallholders around the world and offering them comprehensive support must play a fundamental role here, as they currently already make an important contribution to food security, and the requisite future ecological, social and economically sustainable production and consumption behaviour in future rests on their active involvement and participation.

The reawakened awareness of the value and finiteness of natural resources has refuelled the debate on what a sustainable and resource-saving land and biomass use would have to look like, and what changes would have to be initiated in this respect in order to reach the defined goals. The UBA position paper Sustainable Use of Global Land and Biomass Resources should be considered as a contribution to this discourse. The Federal Environment Agency still views the visions and fundamental principles formulated in 1992 in the Rio Declaration on Environment and Development as a valid basis and a reference frame with regard to the definition and implementation of sustainable development and resource use. The Rio Declaration states that all people – those alive today as well as future generations – are entitled to a healthy and productive life in harmony with nature. Coming close to this guiding principle now needs action at various levels and in various fields. The UBA position paper illustrates some of the paths towards this goal.

THE UBA RECOMMENDS THAT THE FEDERAL GERMAN GOVERNMENT SHOULD:

- remain committed to the principles of sustainable development, and should actively encourage the implementation of the guiding principles of sustainable land and biomass use. Equally important and mutually dependent aims in this respect are the protection and conservation of ecosystem functions during land use with optimum integration of the various land and soil functions and securing the need satisfaction and natural life-support systems of all people and also of future generations. For the purpose of providing food security, food production must be given precedence over the production of renewable raw materials.
- take on a pioneering role in the transformation of the consumption and dietary patterns at a national level. Aims in this respect are sustainable, responsible consumption, the reduction of the meat consumption as well as the mitigation of food waste. An ecological, climate-friendly diet should be rewarded through economic and tax-based instruments, i.e. the value added tax rate for products that harm the environment or the climate should be increased, or respective taxes should be levied. These measures should be accompanied by educational and advisory measures on the promotion of sustainable consumption behaviour as well as measures aimed at increasing the sales of organic products and low-meat menus in public institutions.

- with regard to the EU common agricultural policy, work towards the integration of a strong and binding ecologisation component for direct payments (first pillar of the CAP) as well as towards increased support for rural development (second pillar of the CAP) with a corresponding redistribution of funds. Any future spending of public monies should be coupled with the supply of public goods and services, and sustainable technologies and methods should enjoy increased subsidies.
- undertake a realignment of the bioenergy policy. In this respect, the incentives for using cultivated biomass for energy generation must not be extended further; instead, the use of waste materials and residues according to the cascading utilisation principle should be advanced.
- on a European and an international level, become actively committed to soil protection. This encompasses reviewing the German position with regard to an EU Soil Framework Directive and actively encouraging the setting of a Sustainable Development Goal (SDG) with soil reference.
- contribute internationally to the concept of sustainable, resource-friendly land use. To achieve this, Germany should become actively involved in the development of a sustainable global land management system, supported by targeted R&D activities and cooperative efforts/partnerships.
- with regard to economic and trade policy, call for these to be fundamentally changed to agree with the climate goals of the world community and support the implementation of the UN Development Goals and the Sustainable Development Goals currently being developed. Free trade must be brought in line with ecological and social minimum standards; governments and regulating bodies must join forces against investor abuse of the commodity futures markets and control the outrageous speculation with foodstuffs. The government should continue to actively support the implementation of the UN-CFS ‚Voluntary Guidelines on Responsible Governance Tenure‘.
- with regard to development policy, work towards an adaptation of all transfers as per the goals defined in the IAASTD report. All development political activities should be critically examined and brought in line with the IAASTD report, whose recommended approach is the conservation and promotion of indigenous knowledge and the empowerment of smallholders. Good governance requirements and clear property rights should be linked to development political measures. Where necessary, respective reforms particularly favouring smallholders should be initiated.
- with regard to research funding, it supports cooperative efforts that also have a positive impact on food security in the long term; these include projects on the promotion of resource conservation and resource efficiency.