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Traditional Charcoal in Africa – A Continent in Danger

Content:

1. Danger and Opportunities

This paper is intended to show that it is not sufficient to increase the efficiency of charcoal production and use. There is great danger that a growing charcoal business which employs traditional methods is based on shrinking resources and approaches a collapse.

Fig. 1. Cooking maize porridge (nshima) with charcoal brazier in Lusaka (2011)

But the paper also shows that the chances of a transition to sustainable development in Africa are huge. They are still largely disregarded. Destruction has already occurred through traditional technologies for the production and use of charcoal. This is a reminder and an invitation to the transition to sustainability.

We can say it exaggerated: Africa could be a paradise, but it is wasting its resources and destroys its livelihood if it continues with business as usual. Africa needs urgently innovation institutions for the transition to welfare for all. Annex A gives a proposal for "African Research and Technology Institutes for Sustainability (ARTIS)", dedicated to this transition, creating millions of jobs of great variety.

An urgent objective is to liberate people from the poverty trap. This poverty trap has many forms. Poverty can be self-reinforcing. But it can be overcome. We will first talk about perspectives as access to our topic. We can compare two scenarios:

Scenario 1:
Imagine young people in a country in the South of Sahara waiting at a public place for a job that gives them an income for that day, and with whom they could support their family. But for most

of them this waiting is in vain; they have no training and there are no jobs. They are coming home hungry and angry. They are exposed to the temptation that they are recruited by a terrorist organization, and learn how to use violence. But there are alternatives.

Scenario 2:
Young people go in the morning in a local branch of the "African Research and Technology Institutes for Sustainability (ARTIS) [1]". There they have a variety of chances and the community kitchen ensures that no one is hungry. The services of the Institute include vocational training, as well as assisting in the creation of sustainable jobs. The variety of offerings allows young people to find appropriate education and employment. The creation of these institutions was neglected in the past decades, but the task is urgent. ARTIS can leverage to escape from the poverty trap.

2. Proposal: African Research and Technology Institutes for Sustainability (ARTIS)

The institutions are required in the common good. They work completely transparent with the aim to pave ways to prosperity for all people in Africa. There is no shortage of potentials, but there are no institutions for their implementation and to go the way out of the crisis. These institutions need to strengthen the indigenous population in their abilities and responsibility.

The Innovation Institute are directed at the UN Sustainability Development Goals (SDGs, see Annex B) and to the commitments to adapt to climate change. It takes into account, inter alia, experience with the dual vocational training system and the Escuelas Taller. It creates millions of permanent jobs of great diversity, in the field of training, planning, consulting and in the practical implementation.

In Appendix A the basics of the Innovation Institute are presented. The point is to find lasting solutions to the local problems. Appropriate technologies are needed. These are available, but often unknown. ARTIS can remedy this deficiency.

Access to energy and its advantageous use are crucial for overcoming poverty. This brings us to our subject. The current exploitation of the tree population for charcoal production is a danger for the continent and there are opportunities to avoid collapse at high level.

3. Charcoal Creates Small Incomes – But Only Shortly and with Devastating Consequences

In Africa it has been formed a billion dollar market, which after a period of growth may ultimately destroy the livelihoods of the African population. In GIZ HERA Cooking Energy Compendium, chapter Charcoal Production (https://energypedia.info/wiki/Charcoal_Production) it is explained:

"The common issues characterizing the charcoal production chain in many African countries comprise:

1.unregulated/illegal resources
2.rampant and systemic corruption
3.inefficient conversion technologies
4.a perception that it is a poor man's business
5.considered 'dirty' and economically unattractive
6.free access to wood resources, leading to deforestation and degradation
7.the charcoal business is dominated by a few powerful individuals
'Lessons from eastern Africa's non-sustainable charcoal trade' can be found on the website of the World Agroforestry Center in the publications section."

[1] More Information to the proposal see Chapter 2 and Annex A

The Manual[2] "Simple technologies for charcoal making" of the FAO Forestry Department contains advice which, although written 25 years ago, are still relevant:

> ***"The role of Government in maintaining forest productivity.***
>
> *The foundation of the charcoal industry is the fuelwood production from a nation's forests. Most forests are nominally under some kind of government control in practically all countries nowadays. Governments can play a critical part in ensuring the present and future productivity of their forests by the management policies they apply to them. They should actively concern themselves with the fuelwood logging process to see that regeneration of the forest takes place properly. They should safeguard the forests against fires and illegal wood cutting. They should assist the development of plantations for fuelwood and should provide credits for extraction machinery and for road building to ensure that the maximum permissible yield of fuelwood is obtained from the forest without damaging its powers to regenerate. Fuelwood gathering for charcoal is not usually regarded as a high prestige occupation. But nowadays it is one of the most significant activities carried on in the forests of the developing world and no government can afford, in the long run, to ignore it or treat it with contempt."*

The "NAMA Study[3] for a sustainable charcoal value chain in Ghana" from UNDP states in Subchapter 7.5 Conclusion:

> *"Ghana is a country that has been plagued by deforestation challenges, with commercial logging, extraction of biomass for household energy use and clearing of land for agricultural purposes all contributing to the rapid rate of deforestation in the country. Although policies, regulations and plans have been designed to attempt to alleviate the pressure on the nation's forests, depletion rates remain a cause of major concern.*
> *Charcoal, one of the main fuel sources in the country, has often been overlooked in the country's deforestation prevention strategies, which have emphasized reforestation and switching to modern fuels. However, the reality is that charcoal production is and, at least in the short term, will continue to be, an important source of household energy, particularly in urban areas of the country. If left unaddressed, its unsustainable production will continue to contribute to deforestation."*

It is understood that the charcoal industry (particularly the informal sector) works in an unsustainable manner, leading to a loss of the tree population, particularly in the savannah forests. *„Firewood collection and charcoal production are the largest drivers of forest degradation in Africa, together linked to about 48% of total degradation."* [4]

The „ Poor people's energy outlook 2014" of Practical Action[5] indicates:

> ***"Deforestation**. Forests are declining worldwide and although the rate of deforestation appears to have slowed, globally around 13 million hectares of forests were lost each year between 2000 and 2010, as compared to around 16 million hectares per year during the 1990s (FAO, 2010).*
> *The Food and Agriculture Organization (FAO) has calculated that at a global level, woodfuel collection accounts for nearly half of all removed wood (FAO, 2010) and more than three quarters in Africa and Asia. This is a complex issue because charcoal, which is in high demand in urban areas, comes predominantly from felled trees, while the wood collected by rural women for their own use is mainly dead wood taken from the trees – as they wish to conserve the tree for the future. Fuel efficient biomass stoves could help to reduce over-harvesting and contribute*

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[2] http://www.fao.org/docrep/X5328E/x5328e02.htm#TopOfPage
[3] https://www.google.de/?gws_rd=ssl#q=NAMA+study+ghana
[4] The top ten drivers of deforestation: https://www.allianz.com/en/about_us/open-knowledge/topics/environment/articles/150329-the-top-ten-drivers-of-deforestation.html/
[5] http://policy.practicalaction.org/policy-themes/energy/poor-peoples-energy-outlook/poor-peoples-energy-outlook-2014

to increased tree growth. Such interventions need to address the charcoal trade and use in urban areas as much (or perhaps even more) than rural wood use."

There is widespread consensus that urban households in Africa have no alternative to charcoal and that hope is on more efficient stoves. This is a fatal error. There are almost exclusively African countries and Haiti who have gone down this wrong path and set at risk their forests.

With an annual growth rate of the urban population[6] in Sub-Sahara Africa of 4%, an improvement of the efficiency of 30% is compensated after less than 7 years (s. Table 1.) and the current not sustainable charcoal consumption is reached again. Also an improvement in the production of charcoal is compensated in a few years by the greater number of urban residents. The collapse through the loss of the trees happens at a higher level and is shattering.

Growth rate of urban population in Africa	4%	4%	4%	4%
Year x	1,0	6,7	15,0	17,7
Urban population in Africa after x years	104%	130%	180%	200%

Table 1. Calculation of Urban Population in Africa with Assumption of 4% Growth Rate

<u>The proposal to plant two or more trees as compensation for every cut down tree is a terribly misleading recommendation</u>**[7].** Sustainable management means that the removal corresponds to the average growth (Mean Annual Increase, MAI). In "Biomass Assessment Handbook" it is mentioned[8]: "Some fuelwood crops may have rotations as short as one or two years, whereas in natural forests the rotation may be in excess of 100 years. Natural forest have a very large growing stock, but a relatively low annual yield, of the order of 2 m³ to 7 m³ per ha."

A major disadvantage of the traditional charcoal business is the low efficiency with which the energy of the wood used is converted into energy of charcoal. If one kilogram of charcoal with a calorific value of 30 kJ/kg is produced from 6 to 12 kg of wood with a calorific value of 15 kJ/ kg then this corresponds to an efficiency of 17% to 33%. Thus most of the energy contained in the wood is lost during traditional charcoal production. If the efficiency of the improved charcoal stove is 30%, then in total (related to the calorific value of the wood used) only 5% to 10% is effective i.e. absorbed from the pot. In comparison, fuelwood can be used directly, with efficiencies up to about 50%. Then only a small amount of firewood is necessary for the same task.

The fundamental problem, however, is that the traditional charcoal production causes logging of naturally grown trees. The traditional charcoal business is mainly depending on the "free" provision of the trees and the refusal of the provision for environmental and climate damage. Would these costs be added to the price of the charcoal, it would be the end of this billion-dollar market. It should be noted that this market is financed by poor households. From price increases due to the shrinking forest resources, poor households are particularly vulnerable when they depend on charcoal.

GIZ-HERA Cooking Compendium[9] states:

"*Despite the growing scarcity of wood, charcoal generally remains underpriced by more than 20% to 50%, as only the opportunity cost of labour and capital required for charcoal production and transport are reflected. The production price for the raw material wood is often not reflected when wood is*

[6] Cp. http://blogs.worldbank.org/opendata/africa-s-urban-population-growth-trends-and-projections

[7] http://www.smallstarter.com/browse-ideas/how-to-start-a-charcoal-business-in-africa/

[8] F. Rosillo-Calle et al. (ed.): The Biomass Assessment Handbook – Bioenergy for a Sustainable Environment. Earthscan (2007), p. 84

[9] https://energypedia.info/wiki/Charcoal_Production)

exploited from unsustainably managed wooded areas (e.g. open access areas). In addition, dues are ineffectively collected. Undervaluation translates into wasteful and inefficient production and consumption, and creates a formidable disincentive for forest management and tree growing."

Misleading incentives and wrong statements[10] on the use of charcoal also cause that opportunities to a substantial reduction in wood consumption are neglected. This applies to the lack of use of „Cooking with retained heat" and to solar technology for cooking and heating water (see Chapter 7). With these opportunities the firewood needed reduces to less than 1/10 compared to the wood consumed for charcoal.

The remaining fuel needs are easily covered by plantations, so that the loss of the tree population for the requirements of urban households is completely overcome. There are comfortable chances to move away from traditional production of charcoal.

4. About Production of Charcoal

There is an extensive literature on the production of charcoal in the traditional and industrial scale. Constantly it is pointed out the importance of a sustainable source of wood. But it is also emphasized that this only inadequately succeeds in Africa. The destruction of the tree population by the charcoal consumption of the urban population in Africa can thus repeat on a large scale, what has happened in Haiti.

A detailed presentation to the cooking energy gives the GIZ-HERA Cooking Compendium:
https://energypedia.info/wiki/GIZ_HERA_Cooking_Energy_Compendium, which contains a chapter about charcoal production with further references:
https://energypedia.info/wiki/Charcoal_Production
Also with link to the supra-regional Chaposa project (1998-2002) investigating the charcoal potential for Southern Africa:
https://www.sei-international.org/mediamanager/documents/Publications/Climate/chaposa.pdf
The Chain Concept is explained in:
Analysis of charcoal value chains - general considerations; and Chain Concept Note for Reader.doc
Policy and Distributional Equity in Natural Resource Commodity Markets: Commodity-Chain Analysis as a Policy Tool.
FAO-Forestry paper 63 is a manual for industrial charcoal making (year1985):
http://www.fao.org/docrep/X5555E/X5555E00.htm. The manual
http://www.fao.org/docrep/X5328E/x5328e02.htm#TopOfPage is from the early 1980s and treats traditional non-industrial charcoal production.

5. No trees to be logged

Table 2 shows data of stoves with different efficiencies (in parentheses): 3-Stones-fire (10%), Ben 2 fuelwood stove[11] (41%), traditional charcoal stove (20%) and improved charcoal stove (30%).

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[10] e.g. statement in article of foot note 5: "In comparison to firewood, charcoal is a much cleaner and healthier fuel because it produces very little smoke (and harmful gases) when it burns" is wrong, see EPA-study EPA-600/R-00-052 (2000): Greenhouse gases from small scale combustion devices in developing countries. p. 19: "According to the Indian standard for domestic LPG stoves, the limit for CO/CO_2 emission ratio is 0.02 (BIS, 1984). This ratio provides a simply measured indicator of combustion quality and this limit is thought to keep the risk of acute CO poisoning to acceptable levels. In our experiments, the mean CO/CO_2 ratios for biogas, LPG, and kerosene wick stoves are below this limit. The ratios for all biofuels and charcoal are much higher than this value. The highest CO/CO_2 ratio is found for charcoal. "

[11] http://solarcooking.wikia.com/wiki/Ben

Calulation of Stove Efficiency	Equipment	3-Stones-firewood	Ben 2	Charcoal tradit.	Charcoal improved
	Fuel	Firewood	Firewood	Charcoal	Charcoal
	Unit	Assumptions	03.02.2015	Assumptions	Assumptions
Amount of Water	kg	6	6	6	6
Rise of Temperature	K	75	88	75	75
Net Energy for Heat Up	kJ	1.881	2.207	1.881	1.881
Amount of Vaporized Water	kg	0,1	0,05	0,1	0,1
Heat of Vaporization	kJ	226	113	226	226
Effective Energy Delivered	kJ	2.107	2.320	2.107	2.107
Amount of Fuel	g	1.405	411	351	234
Energy Used	kJ	21.070	6.165	10.543	7.022
Remaining Amount of Produced Charcoal	g	0	15	0	0
Remaining Energy	kJ	0	450	0	0
Stove Efficiency		10%	41%	20%	30%

Table 2. Calculation of Stove Efficiency Examples. Efficiency of 10% for 3-Stones-Fire is the default value recommended by UNFCCC. Efficiencies 20% and 30% for Charcoal Stoves are mean values from R. Bailis: Wood in Household Energy Use[12]

With Table 3 the necessary amount of fuelwood for an annual "Net Energy Demand" of 6000 MJ is calculated. Instead of 6 metric tons of stems and thick branches, consumed annually when using traditionally produced charcoal in a traditional stove (with 20% efficiency), an improved fuelwood stove (Ben 2) would need approx. 1 tonne of wood. Further savings are possible through using thermos technique (cooking with retained heat) and solar cookers, as shown in the last rows.

For the calculation it is assumed that the relation of mass of wood to charcoal is 6 (according to IPCC default value). This relation may be worse (up to 12)[13]. With the factor 12 the relation between the wood-consumption with a charcoal stove to the consumption with the Ben-stove is 12 to 1.
The small remaining amount of needed fuelwood can be supplied easily with short rotation plantations or from pruning of trees. Then logging of trees is completely avoided.

Fuel Consumption per Year	Equipment	3-Stones-firewood	Ben 2	Charcoal tradit.	Charcoal improved
	Fuel	Firewood	Firewood	Charcoal	Charcoal
	Unit	Assumptions	03.02.2015	Assumptions	Assumptions
Net Energy Demand E_eff per Household per Year	MJ/Year	6.000	6.000	6.000	6.000
a) Fuel Consumption B per Household per Year	kg/Year	4.000	985	1.101	667
Percentage of Saving f_thermo via Thermos Technique		45%	45%	45%	45%
Percentage of Saving f_solar via Solar Technique		45%	45%	45%	45%
b) Fuel Consumption including Thermos Technique	kg/Year	2.200	542	550	367
c) Fuel Consumption including Thermos- and Solar Technique	kg/Year	1.210	298	303	202
Wood Consumption per Household per Year:			Short rotation plantation	Thick stems and branches for charcoal	
Mass Ration Wood/Charcoal (IPCC default value)	kg/kg			6	6
a) Without Thermos- and Solar Technique	kg Wood/Year	4.000	985	6.005	3.999
b) Including Thermos Technique	kg/Year	2.200	542	3.303	2.200
c) Including Thermos- and Solar Technique	kg/Year	1.210	298	1.816	1.210

Table 3. Calculation of Annual Wood Consumption of Households with Same Net Energy Demand

6. Greenhouse Gas Emission Caused from Traditional Charcoal – Or a Trip Around the Globe

Use of traditionally produced charcoal an African household can cause CO_2 emissions, equivalent of a car drive from the length of the equator. To illustrate this, we consider a household in Lusaka with an annual consumption of charcoal of more than 1.3 tons. At least 6 tons of wood per ton of charcoal are needed. The share of non-renewable biomass is 85%. At least 1.3 t * 6 * 0.85 = 6.63 t wood are the unsustainable consumption of wood per household and year. CO_2 emission[14] is 1.68 ton CO_2 per ton of wood. Thus, about 11 tons of CO_2 are produced. When a car is used with a CO_2 emission of 0.16 kg of CO_2 per km, then this car can drive more than 68000 km with an emission of 11 tons of CO_2. This is a distance 1.7 times the Earth's circumference. It is therefore only partly true that households in Africa hardly contribute to climate change.

[12] Encyclopedia of Energy, vol. 6, Elsevier Inc. (2004), Table II

[13] Cp. Table 7 of GIZ HERA Cooking Energy Compendium, Charcoal Production, Table 7, https://energypedia.info/wiki/Charcoal_Production

[14] 0.112 kg CO2/MJ * 15 MJ/kg wood = 1.68 kg CO2/kg wood, cp. IPCC-publication: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

7. Pictures Showing Open Source Appropriate Technology (OSAT) to get out of the Charcoal-Crisis

7.1. No smoke in the kitchen

Fig. 2. A fuelwood kitchen in Murcia/Spain without smoke due to the chimney

7.2. Firewood stoves[15] Ben 2 and Ben 3

Fig. 3. Ben 3 with 28-cm-pot (2016)

Fig. 4. Ben 3 with ash pan, grate, tripod, and stove shield for pot (left side) and pan

7.3 Cooking by retained heat[16]

5a. Hay basket utensils

Fig. 5b. 10-liter pot to be inserted

Fig. 5c. Hay basket (Ø 50cm)

Fig. 5a … 5c. show an example of a hay basket with two blankets, two cushions and a cloth to cover the sooted pot. With this assembly 6 liters of water, inserted at boiling point, maintain a temperature above 80 °C for more than 4 hours, so that e.g. the cooking of beans can be finished in the hay basket without surveillance, fuel consumption, emissions nor health burdens.

[15] http://solarcooking.wikia.com/wiki/Ben

[16] http://solarcooking.wikia.com/wiki/Heat-retention_cooking

7.4 Solar Cookers avoiding the rebound effects[17]

Fig. 8.
Solar Cooker Project SOLIN
José Angel Garrido Vázquez, Madrid

Fig. 9.
Products from parabolic solar cookers
SK14/alSol 1.4; baking, conserving, etc.

8. Susainable Sources of Charcoal

The channel arte-tv reported[18] that a young engineer has developed in Mauritania a method to produce charcoal pellets of high quality from reeds.The reed has spread uninhibited as invasive plant and constitutes a nuisance. The use of this reeds as feedstock for charcoal pellets represents an excellent example of the use of opportunities in Africa.

The further development (harvesting equipment, exhaust gas purification, etc.) and dissemination of the process would be an ideal object for the "African Research and Technology Institutes for Sustainability (ARTIS)" proposed in Chapter 2 and further described in Annex A.

In the Internet there are examples[19] of opportunities for processing biomass wastes into charcoal pellets or briquettes.

Annexes:
Annex A: Proposal for: African Research and Technology Institutes for Sustainability (ARTIS)
Annex B: From the website of UNDP about MDGs and SDGs

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[17] http://vignette3.wikia.nocookie.net/solarcooking/images/7/71/How_to_overcome_firewood_crisis-Dieter_Seifert-April_2015.pdf/revision/latest?cb=20150428221259
[18] http://info.arte.tv/de/mauretanien-die-plage-nutzen.
[19] e.g. booklet from Shri AMM Murugappa Chettiar Research Centre Taramani, Chennai –600113. (2010) http://www.amm-mcrc.org/publications/biomasscharcoalbriquetting_english.pdf

Annex A: Notes on the Proposal for

African Research and Technology Institutes for Sustainability (ARTIS)

African Institutes to support achieving the UN Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs)

Creation of Millions of Jobs through Sustainable Development

These notes highlight opportunities to overcome the lack of perspectives, especially among young people, in our neighboring continent Africa. When we consider the number of people who want to escape from misery in their homeland, we recognize that efforts of a completely different dimension than ever before are needed for the necessary transition towards sustainable development.

Not only are the challenges immense, but the opportunities are as well. The urgently needed sustainable development requires millions of of valuable and durable jobs: already through apprenticeship training positions and jobs in the appropriate local production.

Opportunities exist to make use of the human and natural resources. However, instead of appreciating these opportunities, the continent is losing its entrepreneurial population group, is being depleted and used as dumping ground for waste from industrial countries. African countries hardly do their own research and development to take care ordinary household needs. There is a lack of prospects and encouragement.

In 2006/2007 we planned an exhibition on sustainable development at the Parque de las Ciencias, Granada, together with the German Museum (Deutsches Museum, Munich). I had the privilege to give the introductory lecture ("On the Way to Sustainability") to the International Colloquium held there for starting the exhibition. Other presenters covered the broad field of available opportunities and past experiences. For example, one presentation detailed the transformation of a slum into a decent neighborhood while another explained experiences with United Nations Millennium Villages. A traveling exhibition on sustainable development was also envisaged, but the exhibitions could not be materialized because of lack of funds.

For the fundamental improvement of the living conditions in Africa, creation of Innovation African Institutes for Sustainable Development is necessary. These networking Innovation Institutes would focus solutions to meet the needs of ordinary households there, which have been neglected in our high-tech-oriented world since decades.

The institutions might be organized like university institutes, with permanent staff and part-time employees. The facilities would include robust IT resources as well as laboratories, workshops and outdoor installations. Funding could partly come from means to adapt to climate change.

As the institutions ARTIS are independent of commercial interests, and are solely committed to the common good, they should enjoy the highest esteem, striving to be the best driver of a transition to sustainable practices for all.

Unfortunately, the poorest are often the least informed about opportunities such as the cultivation of vegetables, fruits and mushrooms; for the preservation of foodstuffs (according to FAO the post harvest losses are often 30% to 50% of the production); the provision of electricity, heat and drinking water; for hygiene and health care; and for the water regulation by small dams and for drip irrigation.

These Innovation Institutes should make use of all communication channels (television, radio, social media, etc.) to foster education, skills and awareness. By employing the technologies developed resp. promoted by these institutes, millions of jobs can be created, transforming poor, suffering districts into prosperous domains. Individual local initiative should also be strengthened.

The paper "How to Overcome the Firewood Crisis," shows that if two billion people switch from three-stones fires to stoves which are not harmful to health and environment, an installation of effective thermal power of approximately 750 GW is necessary, corresponding to the electric power of 700 nuclear power stations. This calculation may illustrate the magnitude just of one task for the improvement of living conditions in developing countries.

Special emphasis should be placed on the development and dissemination of "Open Source Appropriate Technologies" (OSAT), which can form a basis of the necessary technology transfer.

The European Patent Office (http://www.espacenet.com) and the US government (https://patents.google.com/) provide free access to about 90 millions of patent documents online. It is a documentation beginning in the 19th century. The patent protection period is limited to maximum 20 years, so a wealth of knowledge is freely available. From the patent documentation a great deal of information would be helpful for sustainable development if there is trained staff to benefit from these possibilities.

There is an incredible wealth of unused opportunities to overcome poverty in Africa. With appropriate institutes the Sustainable Development Goals (see Annex B) can be achieved.

Annex B)

From the Website of UNDP about MDGs and SDGs:

http://www.undp.org/content/undp/en/home/sdgoverview.html

A new sustainable development agenda

Voices around the world are demanding leadership on poverty, inequality and climate change. To turn these demands into actions, world leaders gathered on 25 September 2015 at the United Nations in New York to adopt the 2030 Agenda for Sustainable Development.

The 2030 Agenda comprises 17 new Sustainable Development Goals (SDGs), or Global Goals, which will guide policy and funding for the next 15 years, beginning with a historic pledge to end poverty. Everywhere. Permanently.

The concept of the SDGs was born at the United Nations Conference on Sustainable Development, Rio+20, in 2012. The objective was to produce a set of universally applicable goals that balances the three dimensions of sustainable development: environmental, social, and economic.

The SDGs replace the Millennium Development Goals (MDGs), which in September 2000 rallied the world around a common 15-year agenda to tackle the indignity of poverty.

The MDGs established measurable, universally-agreed objectives for eradicating extreme poverty and hunger, preventing deadly but treatable disease, and expanding educational opportunities to all children, among other development imperatives.

The MDGs drove progress in several important areas:

- Income poverty
- Access to improved sources of water
- Primary school enrollment
- Child mortality

With the job unfinished for millions of people—we need to go the last mile on ending hunger, achieving full gender equality, improving health services and getting every child into school. Now we must shift the world onto a sustainable path. The SDGs aim to do just that, with 2030 as the target date.

This new development agenda applies to all countries, promotes peaceful and inclusive societies, creates better jobs and tackles the environmental challenges of our time—particularly climate change. In December 2015, world leaders reached a historic global agreement on climate change at the **Paris Climate Conference**.

The Sustainable Development Goals must finish the job that the Millennium Development Goals started, and leave no one behind.

More about the MDGs and SDGs

- **Progress on the Millennium Development Goals**
  15 years after world leaders committed to a new global partnership to reduce poverty, the Millennium Development Goals (MDGs) have made a profound difference.more
- **2030 Agenda for Sustainable Development**
