

UK HungerFree campaign

Brief on sustainable agriculture

More than a billion people are hungry for the first time in history.¹ Three quarters of the world's poor and 70% of hungry people live in rural communities² and it is now recognised that improving the lot of smallholder-based rural communities is essential to ending poverty and hunger.^{3,4}

ActionAid believes sustainable smallholder agriculture offers a key solution to tackling hunger, as well as addressing poverty and climate change issues. Mounting evidence shows sustainable agriculture is highly productive in poor countries and has other social and environmental benefits.

Sustainable agriculture is well defined

Sustainable agriculture integrates three main goals of environmental stewardship, farm profitability and prosperous farming communities. It refers to the ability of farms to produce food indefinitely, without damaging soils and ecosystems, or human and social capital.⁵

Sustainable approaches aim to maintain healthy soils while reducing reliance on external 'inputs' – such as fertilisers, pesticides and herbicides – by:

- recycling crop waste and livestock manure as a source of nutrients
- avoiding growing one crop over and over, but instead rotating crops and inter-cropping fields with nitrogen-fixing plants (eg alfafa, beans, clover, lentils, peas or peanuts)
- integrating crops, animals, trees and natural pest control on individual farms
- using grasses and clover for animal fodder.^{6,7}

Sustainable agriculture uses a wide variety of practices and technologies and often blends farmers' traditional and local experience with scientific knowledge and innovation. Aimed at ensuring access to healthy and nutritious food throughout the year, it emphasises:

- the use of locally-adapted seeds and breeds
- participatory agricultural research that involves smallholders in improving the crops they grow
- training that spreads knowledge through 'farmer-to-farmer' methods
- collective approaches to solving farming and natural resource problems, such as pests, irrigation, watershed, forest and credit management.^{8,9,10}

Because it relies on local renewable resources and locally-based innovation, sustainable agriculture is particularly well-suited for poor, remote or marginalised communities.

Small-scale agriculture is particularly important

Smallholder farmers play an integral role in global agriculture, producing more than half of the world's food supply.¹¹ Approximately 2.5 billion people in poor countries live directly from agriculture – farming crops and livestock or relying on forestry or fisheries¹² – and 1.5 billion people live in smallholder households.¹³

Small-scale producers include family farmers, herders and pastoralists, landless and rural workers, forest dwellers, fisherfolk, gardeners, indigenous peoples and hunters and gatherers.¹⁴ Women are a substantial majority of the agricultural workforce and produce most of the food that is consumed locally.¹⁵

Of an estimated 525 million farms worldwide, about 404 million are small farms with two hectares of land or less,¹⁶ and these small farms produce the majority of the staple crops needed to feed the world's rural and urban populations.¹⁷

Small farms, for example, provide over 90% of Africa's agricultural production, and in Latin America they produce the majority of the maize, beans and potatoes for domestic consumption.^{18,19}

Smallholders feed poor communities – including themselves – and small increases in yields on their farms could have a profound impact on poverty and access to food at the local and regional levels.^{20,21}

Now's the time to promote sustainable agriculture

The global community is renewing its commitment to food and agriculture in poor countries, and new funds are emerging for agricultural development. The key question is what type of agriculture is best for smallholders?

A host of recent high-level reports endorse the multiple benefits of smallholder-based sustainable agriculture, including from the UN Food and Agriculture Organization (FAO),²² the UN Environment Programme (UNEP),²³ the UN Conference on Trade and Development/UNEP,²⁴ and the UN/World Bank-sponsored International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD).²⁵

The four-year IAASTD global assessment involved 400 scientists and it concludes that current fossil fuel-based agricultural practices have led to serious degradation of land, water, biodiversity and eco-systems (see box). The report calls for a significant shift towards smallholder-based sustainable agriculture – with a particular focus on the needs of poor women.²⁶

Mounting evidence shows sustainable agriculture is productive

Sustainable agriculture can greatly increase productivity in developing countries. This is particularly true if the existing farming system uses few fertilisers and other chemicals, which is largely the case for Africa.²⁸

The largest study examining smallholder sustainable agriculture in poor countries analysed 286 projects covering 37 million hectares in 57 countries. This study was published in 2006 and found that when sustainable agriculture was adopted, average crop yields increased by 79%.²⁹

A variety of crops and resource-conserving systems were used, including integrated pest management, conservation agriculture, agro-forestry, water harvesting in dryland areas, and introducing aquaculture and livestock into farming systems.³⁰

IAASTD on impacts of intensive farming on degradation

Land

1.5 billion people are directly affected by degraded land and soil erosion. Over half of the world's grasslands are degraded

Water

70% of global freshwater withdrawal is attributable to irrigated agriculture

Demand for water for agriculture has led to serious depletion of surface water resources

Biodiversity

75% of the crop genetic diversity that farmers rely on to grow crops has been lost over the last 50 years.²⁷

This database of 286 projects was re-analysed last year by the UN Conference on Trade and Development and the UN Environment Programme to produce a summary of the impacts of sustainable agriculture in 114 projects throughout Africa.

It found crop yields increased by an average of 116% for all African projects and by an average of 128% for projects in east Africa.³¹

The study focused on 15 cases from Africa and found multiple benefits for smallholders and the environment – leading to a build up of natural, human, social, financial and physical capital in farming communities. It found:³²

An increase in food availability – higher yields led to greater access to food, increased food security for all members of the household and higher incomes

Increase in household income – sustainable agriculture had a positive impact on poverty, with smallholders saving money through less fertiliser and pesticide use, extra income from selling surpluses and adding value through processing

Increase in education, skills, health – all farmers gained increased knowledge of sustainable methods, health benefits from more nutritious food, and greater resilience to external threats such as droughts, floods and landslides

Benefits to community – the formation of farmers' groups and co-operatives lowered costs and increased knowledge amongst farmers

Improvements to infrastructure – 40% reported improvements to physical infrastructure (eg communications and transport) and greater access to markets

Benefits to natural environment – all but one of the cases reported benefits to soil fertility, water supply, flood control and biodiversity.

The study highlights that 12,500 farm households in drought-prone Cheha in southeast Ethiopia have benefited from a sustainable agriculture approach by introducing new types of crops (such as vegetables), trees (fruit and forest), organic manures for soil fertility, natural pest controls and veterinary services. This has resulted in a 60% increase in crop yields, a 70% improvement in overall nutrition levels, and the area now produces a food surplus.³³

Sustainable agriculture meets multiple challenges

In addition to feeding the one sixth of the world’s population currently going hungry, small-scale sustainable agriculture offers the best approach to meeting multiple challenges facing the food system.³⁴

Current high-input farming practices that use large amounts of fuel-based fertilisers and pesticides are a major cause of greenhouse gas emissions. An estimated 30% of global emissions leading to climate change – such as carbon dioxide, nitrous oxide and methane – are due to agricultural activities, including land use changes such as deforestation.³⁵

It is now becoming recognised that sustainable agriculture can mitigate climate change through carbon sequestration and by offering a genuinely low greenhouse gas (GHG) emission alternative.³⁶

FAO says sustainable agriculture has huge potential to sequester carbon dioxide from the atmosphere by increasing the organic content in soils. It also says organic agriculture can reduce GHG emissions because it requires 25-50% less energy compared to conventional chemical-based agriculture.³⁷

At the same time climate change is projected to have a devastating impact on food production and food security. The Intergovernmental Panel on Climate Change says yields from rain-fed farming in some African countries could fall by up to 50% by 2020, and by up to 30% in some central and South Asian countries by 2050.³⁸

There is an emerging consensus that recognising the ‘multi-functional’ role of agriculture – ie it provides multiple benefits from food, fibre and medicines, to livelihoods, cultural heritage and water and environmental services – and strengthening the ability of smallholders to build more resilient and sustainable agriculture systems is a crucial response to the global food, water and climate crisis.³⁹



Thabo Chidimba from Gongona in Malawi joined the Coalition of Women’s Farmers and now practices sustainable farming to beat poverty and hunger.
PHOTO: Graeme Williams/Panos

Resilience and feeding the future

Resilience can be understood as the opposite of vulnerability, and such approaches mitigate risk by increasing the adaptive powers of poor communities and the eco-systems on which they depend. This protects the natural resource base and helps smallholders meet their food needs while fostering the necessary skills to adapt to climate change and other stresses.⁴⁰

But climate change is not the only threat to food production. Water scarcity, high energy prices, desertification and other forms of land degradation (such as saline soils), and cropland losses due to biofuels, timber, expanding cities and other factors,⁴¹ will make it harder for humanity to feed itself.⁴²

With populations projected to rise from 6.7 to 9.2 billion by 2050,⁴³ production must double by then⁴⁴ to meet demand for food, feed, fibre and biofuels, and changes in diets towards more meat and dairy.^{45,46}

Global modelling suggests sustainable agriculture could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base.⁴⁷

To achieve this, UNEP advocates a switch to sustainable agriculture. It also recommends reducing large food losses in the field in poor countries, recycling waste in the food chain, and finding alternatives for animal feed (eg from plant waste or fish discard). Together, they say these changes could feed all of the additional three billion by 2050.⁴⁸

Conclusion

Despite record global food production and the fact there is enough food to supply 2,803 kcal per person per day,⁴⁹ over a billion people live with chronic hunger worldwide and the poorest, landless and female-headed households are hit hardest.⁵⁰

Endnotes

1 FAO (2009) *State of the world food Insecurity in the world*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/012/i0876e/i0876e.pdf>

2 World Bank (2007) *World development report 2008: Agriculture for Development.*, Washington: World Bank

3 World Bank (2007) *World development report 2008: Agriculture for Development.*, Washington: World Bank

4 High-Level task force on the global food security crisis (2008) *Comprehensive framework for action*, see: <http://www.un.org/issues/food/taskforce/Documentation/CFA%20Web.pdf>

5 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

6 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

7 Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>

8 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations,

The conventional wisdom is that in order to double food supply, efforts need to be redoubled to intensify agriculture. Such a strategy has been successful in the past, but there are doubts about the capacity of such systems to reduce food poverty. The great technological progress in the last half century has not led to major reductions in poverty and hunger in poor countries.⁵¹

The most sustainable choice for rural development and food security is to increase total farm productivity in situ – in the field – where poor and hungry people live and work and are in most need of greater food supplies.

It is clear that sustainable agriculture is productive and has the potential to meet hunger and food security needs in poor countries. Such approaches allow smallholders to improve local food production with low-cost, renewable resources and technologies, without causing environmental damage.

Benefits of sustainable agriculture identified by IAASTD

Economic stability – more diverse sources of income, spread of labour requirements over time, and less vulnerability to commodity price swings

Improved health and nutrition – more diverse/nutritious diets, less pesticide poisoning

More social resilience – more social support networks and increased ecological skills

Increased ecological resilience – making it easier to adapt to changing environmental conditions

Conservation of natural resources – biodiversity, conservation of soils, improved water quality

Climate change mitigation – increased energy-efficiency, reduced use of fossil fuel-based inputs, more carbon sequestration and water capture in soil.⁵²

see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

9 Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>

10 Scialabba N (2007) *Organic agriculture and food security in Africa*, Rome: FAO, see: <http://www.twinside.org.sg/title2/susagri/susagri051.htm>

11 Altieri, M (2009) *Small farms as a planetary ecological asset: five key reasons why we should support the revitalisation of small farms in the global south*, Penang: Third World Network

12 Pimbert M (2009) *Towards food sovereignty: reclaiming autonomous food systems*, London: International Institute for Environment and Development, see: <http://www.iied.org/natural-resources/key-issues/food-and-agriculture/multimedia-publication-towards-food-sovereignty-reclaiming-autonomous-food-sys>

13 World Bank (2007) *World development report 2008: Agriculture for Development.*, Washington: World Bank

14 Pimbert M (2009) *Towards food sovereignty: reclaiming autonomous food systems*, London: International Institute for Environment and Development, see: <http://www.iied.org/natural>

resources/key-issues/food-and-agriculture/multimedia-publication-towards-food-sovereignty-reclaiming-autonomous-food-sys

15 World Bank (2009) *Gender in agriculture sourcebook*, Washington: World Bank

16 IAASTD (2008) *Agriculture at a crossroads*, International assessment of agricultural knowledge, science and technology for development. Washington DC: IAASTD. See: <http://www.agassessment.org>

17 Altieri, M (2009) *Small farms as a planetary ecological asset: five key reasons why we should support the revitalisation of small farms in the global south*, Penang: Third World Network

18 Nagayets, O (2005) *Small farms: current status and key trends. Information brief prepared for the future of small farms research workshop Wye college*, June 2005. Washington DC: International Food Policy Research Institute

19 Altieri, M (2009) *Small farms as a planetary ecological asset: five key reasons why we should support the revitalisation of small farms in the global south*, Penang: Third World Network

20 Altieri, M (2009) *Small farms as a planetary ecological asset: five key reasons why we should support the revitalisation of small farms in the global south*, Penang: Third World Network

21 World Bank (2007) *World development report 2008: Agriculture for Development*, Washington: World Bank

22 Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>

23 UNEP (2009) *The environmental food crisis*, Nairobi: UNEP, see http://www.unep.org/publications/search/pub_details_s.asp?ID=4019

24 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

25 IAASTD (2008) *Agriculture at a crossroads, International assessment of agricultural knowledge, science and technology for development*. Washington DC: IAASTD. See: <http://www.agassessment.org>

26 IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington DC: IAASTD

27 IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington DC: IAASTD

28 Ching, L (2009) *Is ecological agriculture productive?*, Penang: Third World Network, see: http://www.twinside.org.sg/title2/briefing_papers/No52.pdf

29 Pretty, J *et al* (2006) *Resource-conserving agriculture increases yields in developing countries*, *Environmental Science and Technology (Policy Analysis)*

30 Pretty, J *et al* (2006) *Resource-conserving agriculture increases yields in developing countries*, *Environmental Science and Technology (Policy Analysis)*

31 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

32 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

33 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf

34 IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington DC: IAASTD

35 See World Bank (2007) *World development report 2008: Agriculture for development*, Washington: World Bank, and IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development.

36 Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>

37 Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>

38 IPCC (2008) *Intergovernmental Panel on Climate Change Fourth Assessment Report*, Geneva: IPCC

39 See: IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington DC: IAASTD; UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf; World Bank (2007) *World development report 2008: Agriculture for development*, Washington: World Bank; Niggli, U *et al* (2009) *Low Greenhouse gas agriculture, mitigation and adaptation potential of sustainable farming systems*, Rome: FAO, see: <ftp://ftp.fao.org/docrep/fao/010/ai781e/ai781e00.pdf>; High-Level task force on the global food security crisis (2008) *Comprehensive framework for action*, see: <http://www.un.org/issuess/food/taskforce/Documentation/CFA%20Web.pdf>; UN Commission on Sustainable Development (2008) *chairman's summary – Part 1*. New York: United Nations; FAO (2008) *Declaration of the high-level conference on world food security: the challenges of climate change and bioenergy*, see: http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/declaration-E.pdf; De Schutter, O (2008) *'Building resilience: a human rights framework for world food and nutrition security'*, New York: United Nations; UNEP (2009) *The environmental food crisis*, Nairobi: UNEP

40 Adger, W.N (2003) *Governing natural resources: institutional adaptation and resilience*, in *Negotiating environmental change: new perspectives from social science*, F. Berkhout, *et al* (eds.), Cheltenham: Edward Elgar

41 Chatham House (2009) *The feeding of the nine billion*, London: Chatham House

42 UNEP (2009) *The environmental food crisis*, see http://www.unep.org/publications/search/pub_details_s.asp?ID=4019

43 UN Population Division (2008) *United Nations, Department of Economic and Social Affairs*

44 *'Farming must change to feed the world'* FAO press release, 4 February 2009, see: <http://www.fao.org/news/story/en/item/9962/icode>

45 IAASTD (2008) *Agriculture at a crossroads*, International assessment of agricultural knowledge, science and technology for development. Washington DC: IAASTD.

46 UNEP (2009) *The environmental food crisis*, see http://www.unep.org/publications/search/pub_details_s.asp?ID=4019

47 Badgley, C *et al* (2007) *Organic agriculture and the global food supply*, Renewable agriculture and food systems, Cambridge University Press

48 UNEP (2009) *The environmental food crisis*, Nairobi: UNEP, see http://www.unep.org/publications/search/pub_details_s.asp?ID=4019

49 IAASTD (2008) *Agriculture at a crossroads*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington DC: IAASTD

50 FAO (2009) *'More people than ever are victims of hunger'*, FAO brief, 19 June 2009

51 UNCTAD/UNEP (2008) *Organic agriculture and food security in Africa*, New York: United Nations, see: http://www.unctad.org/en/docs/ditcted200715_en.pdf;

52 IAASTD (2008) *Agriculture at a crossroads*, International assessment of agricultural knowledge, science and technology for development, Washington DC: IAASTD

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