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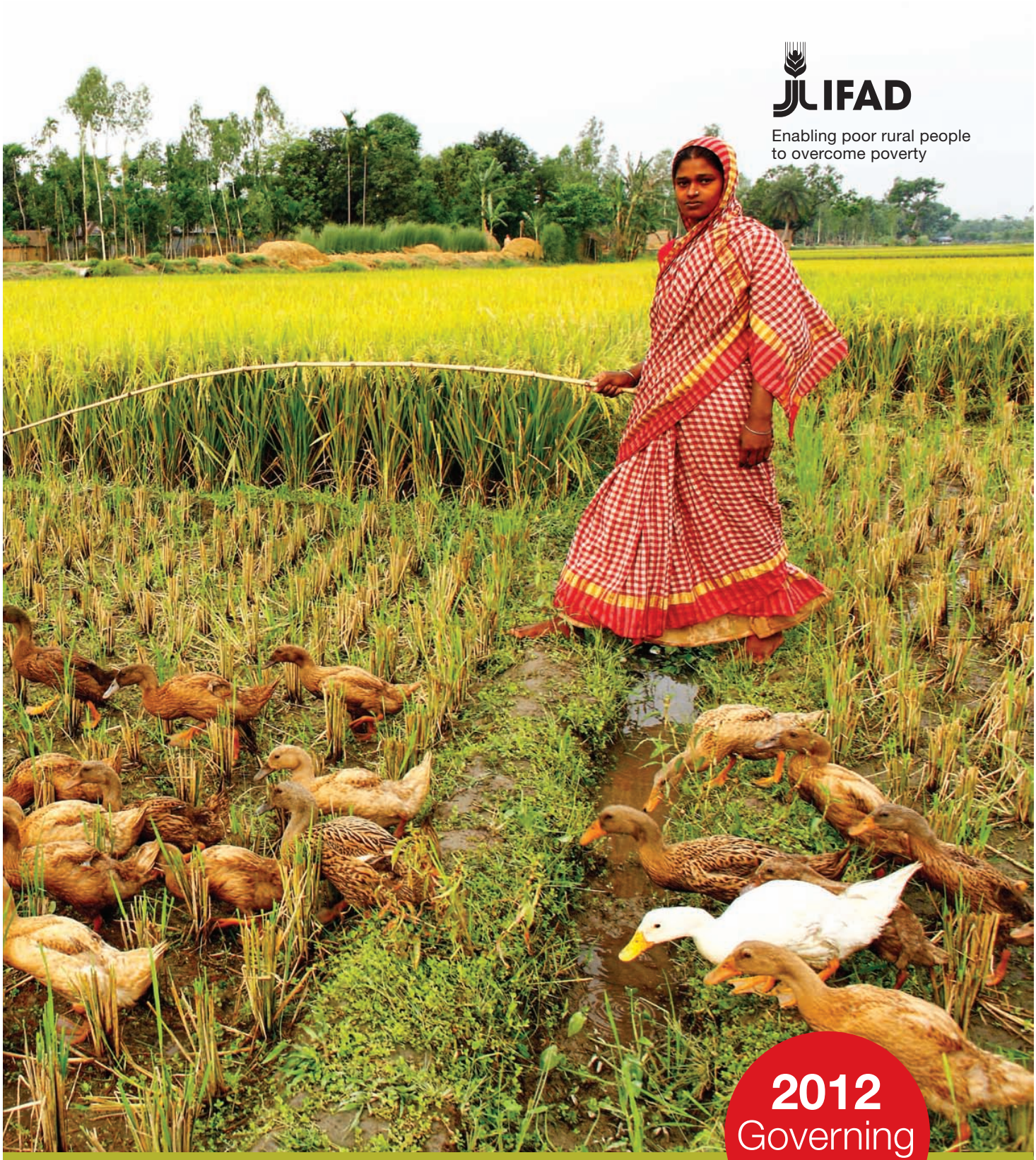
Enabling poor rural people
to overcome poverty



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Governing
Council

Sustainable smallholder agriculture:
Feeding the world, protecting the planet

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Introduction

As the world belatedly turns its attention to the pressing issues of environmental degradation, resource scarcity and climate change, the concept of sustainability takes its rightful place at centre stage in discussions about agricultural and rural development.

Farmers face two stark realities over the next four decades: They must produce 70 per cent more food by 2050 to feed a growing, more urbanized population, and they must do so facing the likelihood that arable land in developing countries will increase by no more than 12 per cent.[1] That monumental challenge can be met only if sustainability is the foundation of approaches to food security and poverty reduction in every country and every community. No other strategy has a hope of feeding current populations while protecting and restoring the natural resources that future generations will need to support their livelihoods.

This means that food production must be intensified even as production methods evolve. The agriculture sector will become more community-focused, establishing an appropriate local balance of crops, livestock, fisheries and agroforestry systems to avoid overuse of pesticides and inorganic fertilizers and to protect soil fertility and ecosystem services – while increasing production and income. It will be imperative to work within ecosystems, using natural processes and a mixture of new and traditional technologies.

Fortunately this is already beginning to happen. Farmers around the world are demonstrating the benefits of preserving natural assets and working in harmony with local ecosystems:

- In Brazil, three southern states support zero-tillage and conservation agriculture.[2]
- The African Conservation Tillage Network is bringing together farmers and policymakers who are dedicated to improving agricultural productivity while using natural resources sustainably.
- The Chinese government's 11th Five-Year Plan (2006-2010) emphasized the need to reduce the environmental impact of agriculture and called for organic foods, water conservation and sustainable practices.
- In the Philippines, the Government has stopped its fertilizer subsidy programme and introduced a balanced fertilization policy that promotes location-specific combinations of organic and inorganic fertilizers.

1 The current world population of 7 billion is projected to reach 9.3 billion by 2050 and 10.1 billion by 2100. See *2010 Revision of World Population Prospects*. United Nations Department of Economic and Social Affairs (2010). Estimate of arable land comes from Bruinsma (2009), as cited in IFAD's *Rural Poverty Report 2011*.

2 Conservation agriculture aims to achieve sustainable and profitable agriculture by promoting three principles: minimum soil disturbance, permanent soil cover and crop rotation.

- The Indian state of Rajasthan is supporting watershed and soil management and incentives for use of biofertilizers.
- Indonesia has banned some pesticides and introduced farmer field schools to teach integrated pest management.[3]

However, many of these successes remain piecemeal and fragmented. We know that sustainable agriculture is the only way forward – but many of the necessary policies are not yet in place to scale up successful approaches and ensure widespread adoption.

Smallholder farmers, when guided by coherent policies and fair incentives, have shown they are willing and able to change how they do business. With access to appropriate technologies and innovations and relevant training, they have produced results with multiple benefits for communities, ecosystems and natural assets as well as themselves. But without institutional support it is unrealistic to expect poor farmers to change their practices for altruistic reasons. We need to work with smallholders and support them so they can become the developers of sustainable solutions. That is the best way to boost food production and improve livelihoods in an environmentally sustainable way.

The crucial role of smallholders

Four fifths of the developing world's food is produced on about half a billion small farms.[4] Smallholder farmers live and earn their livelihoods in the world's most ecologically and climatically vulnerable landscapes – hillsides, drylands and floodplains – and rely on weather-dependent natural resources. They are at the forefront of the world's efforts to deal with climate change, environmental degradation, poverty and child labour.[5] These women and men, especially indigenous people and young people, make up the largest share of people living on less than $1.25 per day and represent the bulk of the world's malnourished people. Through a mixture of ingenuity and toil, they manage to feed about one third of humanity despite the enormous difficulties they face.

An unpredictable global context

Three uncontrollable factors – climatic conditions, pressures on natural resources and rising prices – are deviling farmers everywhere. These uncertainties pose special challenges for smallholders, whose poverty leaves them with no margin to cushion unpredictable events.

Farmers are struggling to maintain crop yields as they confront droughts, rising sea levels and soil degradation. The growing demand for meat and dairy products among burgeoning middle classes in populous countries is raising pressures on scarce natural resources. Rising prices for energy and inputs make farming more expensive for poor smallholders. Rising food prices could benefit them – if they get access to the inputs, technology, knowledge and markets that will expand their productivity.

3 IFAD, *Rural Poverty Report 2011* (Rome, 2011). Integrated pest management takes into account the life-cycles of pests and their interaction with the environment, reducing the need for pesticides.

4 FAO, *Save and Grow* (Rome, 2011), chapter 1, available at www.fao.org/ag/save-and-grow/en/1/index.html. Around 97 per cent of agricultural holdings in developing countries are below 10 hectares (FAO Agricultural World Census).

5 Sixty per cent of all children involved in child labour are working in agriculture (ILO, 2010).

"Even with the great advances of the Green Revolution, nearly one billion people are still hungry or undernourished. Now, farmers around the world experiment with integrated soil, water and plant management methods. These methods blend modern science and traditional knowledge. At Rio+20, we should aim to accelerate an 'evergreen revolution'. This revolution will meet the growing global food demand while protecting soils, water and biodiversity. This is the way of the future."

– Rio+20 Secretary-General, Mr. Sha Zukang

Smallholder producers are the backbone of rural economies and often major contributors to national food export markets. But their immense contribution to feeding the world has even more potential. To realize this growth will require investments that will give smallholders access to a range of assets and tools: green technologies, energy, land, credit, training, infrastructure, market information and political voice.

The international agenda

The imperative of moving towards more sustainable agriculture practices that respect local ecosystems within broader landscapes is gaining momentum in international debates. Agriculture will be a major issue at the Rio+20 Conference on Sustainable Development next June, and it has figured prominently in debates leading to the upcoming United Nations Climate Change Conference in Durban in November-December.[6] This is the context in which IFAD, as a financial institution, will promote the need to increase investment in agriculture and promote a sustainable approach to farming that empowers smallholder farmers. The goal is to unleash their potential to expand economic growth and contribute to global food security.

Shifting paradigms

Too often it is assumed that a trade-off is inevitable between maximizing agricultural production and caring for the environment. This is a false choice. We can and we must achieve both – or we will fail in both.[7] In the long run, agricultural production cannot be sustained at the cost of undermining natural assets. In most parts of the world, we are seeing the costs of unsustainable agriculture:

- Three quarters of crop diversity has been lost since 1900.[8]
- Seventy per cent of fisheries are in danger, threatened by overfishing and environmental degradation.[9]
- About 5.2 million hectares of forest are lost every year.[10]

Viewing the agriculture sector as renewable rather than extractive is the only way forward. This approach embraces the idea that agriculture is an interaction with wider ecosystems, while it simultaneously improves livelihood options for those who farm the world's approximately 500 million smallholdings. In the long term, there is no trade-off between production and sustainability. In fact, the opposite is true: without sustainability, production will suffer.

6 The 17th Conference of the Parties to the Convention on Climate Change (Durban Conference, 28 November-9 December 2011) will focus on implementation of the Convention and the Kyoto Protocol, as well as the Bali Action Plan and Cancun Agreements.
7 The Alliance for a Green Revolution in Africa estimates that in Africa environmental degradation is responsible for losses of between 4 and 12 per cent of GDP.
8 FAO, *The State of the World's Plant Genetic Resources for Food and Agriculture*, Second Report (Rome, 2010).
9 See: www.iucn.org/about/work/programmes/pa/pa_what/?4646/Marine-Protected-Areas--Whyhave-them
10 FAO, *Global Forest Resources Assessment 2010*, Forestry Paper 163 (Rome, 2010).

In the short run, however, without the necessary support and policy environment, smallholders operating near or under the poverty line may not always have the incentives to prioritize sustainable approaches. For example, when farmers operating under subsistence conditions are offered the opportunity to boost yields by using chemical fertilizers, they are likely to do so if it is the best means available to feed their families.[11] But where the right policies and incentives are in place, smallholders have shown they will take a long-term view, prioritizing sustainable techniques. Government policies that create disincentives for smallholders to care for natural resources lead to disastrous results, threatening the very capital that rural communities need for long-term survival.

New and sustainable approaches to agriculture offer improved livelihood opportunities for smallholders. At the same time, they typify the landscape approach to agriculture,[12] which is needed to maintain and augment the planet's natural resource base. Smallholders throughout the world are already showing us that these approaches can enrich farmers and ensure the long-term survival of communities while simultaneously renewing and preserving the world's natural assets.

The need for locally specific solutions

The global challenge of sustainable agriculture requires very local solutions. From place to place there are enormous differences in natural resource endowments, population densities, social and political relations, and market opportunities – and the results of generation upon generation of experimentation, innovation, learning and refinement. They offer different opportunities for sustainable intensification, have different requirements and face different constraints.

Consider fertilizer. In many areas of sub-Saharan Africa, integrating sustainable practices may call for increasing use of fertilizer as a necessary adjunct to organic methods. But in many parts of Asia, integration of crop and livestock systems and improved organic-based plant nutrient management may reduce the need for fertilizer. Different agricultural systems can become more sustainable and at the same time more productive and profitable.

Access to green technologies and innovations

Sustainable innovations are bringing multiple benefits in terms of yield, profit, climate resilience and poverty reduction:

- In Malawi and Zimbabwe, planting acacia trees in maize fields has tripled yields and improved the resilience of the soil while boosting nitrogen content and water retention capacity and moderating the micro-climate.[13]
- In an IFAD-supported project in Nyange village in Ngororero, Rwanda, students at a farmer field school are increasing yields by up to 300 per cent (compared to yields under traditional methods) by using integrated pest management and applying fertilizer only when there is a demonstrated need.
- In Guangxi province in rural China, IFAD and the Government have supported households in building biogas plants that use waste from farm animals and household toilets to generate energy for cooking and also produce high-quality

11 With agricultural technologies and inputs, as with all else, prices influence demand. Subsidies on agrochemicals, inorganic fertilizers or on agricultural water all encourage their use. In some regions, phasing out those subsidies makes much sense, combined with introducing subsidies for biofertilizers.

12 Landscape approaches integrate plans for food production and other land uses into broader plans for environmental preservation, clean water, clean air and preservation of biodiversity for the long-term.

13 See: http://www.africanagriculturebloc.com/2010/11/fertilizer-tree-triples-malawi-zambia.html for more information.

organic fertilizer. Family health has improved, an estimated 56,600 tons of firewood have been saved annually, farm yields have increased and the average income in the village has quadrupled.

Innovations in green energy sources are another potential solution. Solar photovoltaic pumping systems,[14] windmills, solar direct desalination, solar cookers, solar refrigerators and solar electricity are just a few of the green technologies that are already available and could be adapted to rural communities. All offer enormous potential savings in energy and money; the major challenge for adaptation is the upfront cost.[15]

However, innovative tools will only work if supported by the right policies, infrastructure and market structures. Green energy systems may be available, but they are useless to poor rural people if they cannot access credit to buy them or training on how to use them. New approaches may increase yields, but if the producer has no way to get her produce to markets, the effect on her livelihood will be negligible. The influence of new production technologies will be minimal if smallholder producers cannot obtain price information or access networks where they can gain fair prices for their products. In other words, innovation must come about within a fundamentally improved system that allows smallholder producers to reap the rewards of their creativity and hard work.

Scaling up sustainable agriculture will also require increasing investment in agricultural science research. Support for research in developing countries is generally inadequate and is being scaled back. Reversing this trend is urgent, says the Global Conference on Agricultural Research for Development.[16] More research funding is needed if sustainable intensification is to contribute to raising agricultural productivity. And more of it must be spent on the challenges of sustainable intensification faced by smallholder farmers.

Policies and an enabling environment

To repeat a key point: Where a supportive enabling environment is in place, smallholders will adapt green approaches to local contexts and scale up their successes. Policymakers have access to a range of tools to unleash the potential of smallholder producers to build sustainable livelihoods while simultaneously helping the world to protect natural resources and mitigate climate change. Following are summaries of some of the key issues to be addressed.

Removing disincentives and creating a level playing field for green technologies

Distorting trade policies and subsidies together with ineffective land management policies create disincentives for farmers. Government policies in both industrialized and developing countries often leave green agricultural approaches and technologies at a disadvantage. However, there are encouraging signs that this is beginning to change:

- India, Indonesia and the Philippines have removed insecticide subsidies and reduced insecticide use by 50 to 75 per cent, while rice production continues to increase.

14 An environmentally sustainable way of improving water access for rural households, reducing soil salinity and erosion, allowing production during dry seasons and increasing agricultural production by up to 30 per cent. A photovoltaic panel receives sun rays, which in turn produce electricity to generate a pump that is submerged in a borehole. Water is then pumped through an outlet pipe into a water tank for collection.

15 Green energy sources tend to have higher upfront costs than traditional devices. But taking into account the extremely low running and maintenance costs, the savings over the natural lifetime of such technologies are in the thousands of dollars.

16 IFAD, *Rural Poverty Report 2011* (Rome, 2011), chapter 5.

- Brazil has implemented minimum-till agriculture on 60 per cent of the country's cultivatable land.
- Agroforestry is practised on 12 to 25 per cent of agricultural land worldwide.
- The Chinese Ministry of Agriculture has developed a certification framework for agricultural products and offers a range of subsidies to promote use of organic fertilizer and minimum-tillage practices.
- The Government of Moldova, with IFAD support, is promoting regeneration of large swaths of erosion-prone farmland by supporting farmers to use no-tillage farming techniques that preserve soil fertility and enhance resilience to drought-induced crop failures.

These initiatives have been shown to increase productivity while improving the supply of critical environmental services.[17] When governments support sustainable approaches to agriculture with multiple benefits, everyone wins. Questions need to be asked as to why this is not happening on a larger scale.

Providing financing

The resources needed by smallholders to adopt sustainable agricultural intensification are significant. Adapting to new production systems and technologies while dealing with the effects of changing climatic patterns will require significant financial support. We must ensure that:

- Financing is available to help them adapt to new production systems and climatic and environmental conditions.
- Innovative financial services are set up to support them in prioritizing sustainable natural resource management (microfinance[18] is a crucial tool here, as is payment for environmental services).[19]

Ensuring clear rights to land

Weak institutional environments and unjust laws and practices regarding land ownership and tenure make it difficult for smallholders to approach farming with a long-term perspective and therefore to prioritize sustainable approaches to farming. This is a particular impediment for women, indigenous people and young people, who are hampered by discriminatory laws and inheritance rules as well as cultural norms and practices. Providing communities and individuals with clear land rights gives them the incentive to restore or maintain environmental resources, such as replanting and managing forest areas. Equally worrying are land grabs by private entities that can deprive smallholders of their farmland and create an unstable environment.

17 IFAD, *Rural Poverty Report 2011* (Rome, 2011), chapter 5.

18 Innovative loan products are needed to finance rural water and renewable energy products. A survey in West Africa of prospective microfinance clients found that over 80 per cent had a project related to water that would help increase farm productivity, but only 1 in 10 clients were able to acquire funding to implement their projects. In terms of energy, microfinance can allow rural households to turn away from traditional energy sources (wood, diesel and kerosene), which are expensive and damage the environment, and towards renewable sources such as solar systems, wind energy and biogas.

19 Payment for environmental services is another way of giving smallholders access to the resources they need as well as ensuring they receive just rewards for the important work they do. In Foz do Iguacu in Brazil, the operators of Itaipu Dam, which provides 25 per cent of Brazil's energy, pay municipalities along the reservoir lake to provide the environmental service of implementing no-till agriculture to reduce siltation at the dam. In Morocco and Kenya, the Green Water Credit initiative provides regular payments to downstream water users in recognition of their important role in managing land and water resources. This enables farmers to invest time and resources in green water management, while diversifying their income and helping them to stay out of poverty (see: www.greenwatercredits.org/).

In cooperation with the World Agroforestry Centre, IFAD is running a programme called Rewarding Upland Poor for Environmental Services (RUPES) in 12 sites in China, Indonesia, the Lao People's Democratic Republic, Nepal, the Philippines and Viet Nam. Communities are given secure land rights; in return they provide environmental services such as replanting trees, managing forest areas and applying soil protection techniques on their plots. Other activities such as watershed preservation and the shoring-up of carbon sinks are offering knock-on benefits to lowland communities. These activities are showing that when smallholder farmers have secure rights to the land they farm, they have greater incentives to adopt sustainable, green approaches to farming.

Building resilience

Smallholder producers generally lack safety nets to catch them in the event of calamitous weather events, crop failures, economic shocks and illness or death of family members. This severely hampers their ability to stay out of poverty. It also affects their willingness to take on risks in the form of new livelihood strategies and approaches. If smallholders are to be protagonists in bringing about sustainable agricultural intensification, they will need support in dealing with the risks they face.

In the Tarija region of Bolivia, rural areas are highly dependent on rain cycles, and farmers are vulnerable to drought, frost, hail, flood and other weather-related adversities. A pilot crop insurance scheme, supported by the International Labour Organization, is now offering farmers triple protection: insurance against loss of food crops, life insurance in case a close family member dies and property insurance. Plans call for the project to be rolled out nationally in 2012. Schemes such as this empower farmers to make investments, in the knowledge that if things go wrong they will not fall deeper into poverty or be forced to migrate to cities in search of work.[20]

Engaging private investment

The private sector's role in driving green agricultural growth that enables smallholders to move beyond subsistence farming should be maximized. Food markets are evolving rapidly, providing enormous scope for exploring ways to help smallholders link up with food value chains that operate sustainably. The interactions between private actors (smallholder producers, intermediaries, entrepreneurs and small, medium-size and large national and international businesses) determine production, marketing, economic and environmental outcomes. These actors need to be actively engaged in a way that encourages investment in smallholder agriculture while protecting the welfare of rural women and men and the environment.

Public-private partnerships have the potential to reduce the risks associated with investing in smallholder agriculture, facilitate networks, identify untapped opportunities and create win-win solutions. IFAD's forthcoming Private Sector Strategy will build a framework upon which these partnerships can be fostered and the right investments made to generate and scale up new and sustainable livelihood opportunities.

20 For more information, see: www.guardian.co.uk/global-development/poverty-matters/2011/feb/21/micro-insurance-protect-poor.

In Sao Tome and Principe, cocoa's extreme price volatility caused many producers to abandon their farms. Thanks to a partnership promoted by IFAD, between French chocolate producer Kaoka and local smallholders, superior aromatic cocoa beans were produced using traditional farming methods, fetching higher and more stable prices than common cocoa.[21]

Achieving cooperation at every level

Translating sustainable agricultural practices into large-scale, coordinated plans of action will require cooperation between actors globally, nationally and locally. It will also require effective communication between governmental ministries and all subsectors of agriculture, from production to processing and marketing. Equally importantly, it will require that farmers' voices are heard.

Fragmentation between and within local, national and international policies frequently undermines efforts to address and combat the world's environmental and climate change challenges. A large-scale, global movement to intensify sustainable agriculture will require all parties to act together, with consistency, and to complement each other's actions. The necessary changes cannot take place if short-term political or business interests are given precedence in key decisions at any level by any actor.

Opportunities for smallholder farmers to acquire new skills and knowledge

Practising sustainable agriculture is not easy. It is a knowledge-intensive, skilled activity based on constantly changing environmental, social and institutional conditions that are specific to communities. Scaling up is most likely to succeed if the women and men responsible for implementing sustainable practices on their farms receive adequate training and support. Nurturing an institutional enabling environment for smallholders – with a focus on access to knowledge, inputs, credit and markets – must form a key part of the movement towards sustainable approaches.

Basic education

Access and quality of education in rural areas are in need of urgent attention:

- Rural-urban gaps remain wide in education enrolment and attainment rates.
- Basic education is frequently biased against agriculture.[22]
- Basic education generally fails to teach young people about agriculture in the context of sustainable development or to appreciate how it is linked to communities' development aspirations.

21 IFAD launched a three-year pilot project involving 500 farmers in 11 communities, with Kaoka agreeing to supervise the project and to purchase as much certified organic cocoa as the farmers could produce. By the end of the pilot project, the farmers had produced 100 tonnes of certified organic cocoa that sold for two and a half times the price of common cocoa. The farmers subsequently formed a cooperative and signed a five-year contract directly with Kaoka, guaranteeing them a stable price. IFAD has scaled up organic, aromatic cocoa farming to another 12 communities in Sao Tome within its ongoing Participatory Smallholder Agriculture and Artisanal Fisheries Development Programme.

22 A recurring theme at IFAD's 2011 Governing Council High-Level Panel and Side Events was the difficulty in motivating talented young people to use their skills in agriculture; the negative image of the sector that comes out of schools is believed to be a significant contributing factor. (Proceedings available at: https://webapps.ifad.org/members/sessions/88184-34th-session-of-the-governing-council/documents/199/get/english)

Vocational training

Technical and vocational education and training (TVET) has the potential to upgrade the skills of smallholder farmers, introduce them to sustainable techniques and technologies, and enable them to improve their livelihood opportunities. However, this sector has suffered from a lack of focus in recent years. Outcomes from existing courses have not always reached expectations. This sector needs reinvigoration, with emphasis on:

- targeting young people
- reducing the gender gap in access
- facilitating the involvement of the private sector in courses
- adapting sustainable farming practices and green technologies to local realities
- ensuring participatory, inclusive approaches with curricula grounded in local conditions.

A successful example of TVET is farmer field schools. This approach brings together concepts from agroecology, experiential learning and community development. Farmers carry out activities that help them understand the ecology of their farmlands. The knowledge they gain allows them to make crop management decisions relevant to their situation. More than 2 million farmers have participated in this type of learning since it was introduced by FAO in 1989.[23]

Inclusion of diverse actors

To adopt environmentally sustainable approaches to smallholder agriculture, we will need to capture and use the diverse skills of all the actors operating in the sector. But certain groups have traditionally been constrained from contributing to advancing rural agriculture: Loss of land rights by indigenous peoples has precluded many from applying their knowledge to preservation of biodiversity and renewal of the natural asset base on which agriculture depends; women's unequal access to assets such as credit and training has severely limited their productivity; and ambitious young people in search of decent work have been discouraged from farming due to its low status, low income and uncertain prospects. We must be certain that all of these groups receive the opportunity to contribute their abilities and knowledge.

Indigenous people

Indigenous farming traditions and knowledge represent an untapped resource in efforts to protect the world's natural asset base, mitigate climate change and improve livelihood opportunities for smallholder producers:

- Indigenous women and men possess unique, in-depth and locally rooted knowledge of the natural world.
- Traditional indigenous land and territories contain 80 per cent of the world's biodiversity, so indigenous people have the potential to play a leading role in managing natural resources.

23 Another impressive example of participatory community-based TVET is Songhai, established in Benin and since replicated in numerous other countries in sub-Saharan Africa. This agricultural entrepreneurship training centre focuses on providing an entrepreneurial platform for young African farmers to develop skills to practise sustainable, profitable agriculture. Activities at the centres focus on green technologies and renewable energy as well as business and life skills training. Songhai values the principle of working in harmony with local ecosystems, and centres are adapted to the realities of the environments in which the trainee farmers operate. In 2008 Songhai was promoted as a Centre of Excellence for Africa by the United Nations.

Women

Sustainable, holistic approaches to agriculture must be based on equity. Any plan that does not use the skills of half the world's farmers and take their needs into account is doomed to failure.

- Women make up a significant portion of the agricultural workforce in developing countries.
- Large gender gaps exist in access to extension services, credit and land tenure, and these are at odds with women's contributions to agriculture.[24]
- Making full use of the skills of both women and men is urgent, particularly given the scope of the challenges ahead.

Young people

Sustainable agricultural intensification puts a premium on knowledge and innovation, and this makes it particularly well-suited to young farmers. For young people to be attracted to agriculture, however, it needs to be grounded in a new narrative that highlights the modern and innovative character of the proposed agenda and the potential of agriculture itself as a profitable activity in today's natural and market environment.

The future

With policy support and adequate funding, sustainable agricultural could be intensified over large production areas in a relatively short period of time. The challenge facing policymakers is to find effective ways to scale up sustainable approaches so that hundreds of millions of people today and tomorrow can benefit. Some of the key needs are:

- Large-scale investment in agricultural research to find out what works, where it works and how to adapt it to local contexts.
- Assessment of the harm caused by current practices on agroecological systems.
- Decisions at national level about which production systems are unsustainable and which sustainable approaches are suitable for scaling up.
- Work with farmers to validate and adapt approaches to local ecosystems.
- Preparation of plans for investment in appropriate policies and institutions, including farmers' organizations.
- Monitoring, evaluation and review of progress, making adjustments where appropriate.[25]

Throughout the world, it is clear that sustainable agriculture is the answer. Farmers have produced countless examples of the advances that result when people work in harmony with nature. In the long term, this is the only way we can achieve sustainable solutions to hunger and poverty.

24 It is estimated that if women had the same access to productive assets as men, they could increase their yields by 20 to 30 per cent. This would imply a 2.5 to 4 per cent increase in agricultural output in developing countries, which in turn could reduce the number of hungry people in the world by 12 to 17 per cent. (FAO, *The State of Food and Agriculture*, [Rome, 2010])

25 See: FAO, *Save and Grow* (Rome, 2011) for more information on the challenges of sustainable agricultural intensification and how it could shape the future.

Questions for discussion

Reflection on the following questions will guide the high-level panel discussions:

- Given current knowledge about sustainable agriculture and the evidence of how these approaches have succeeded throughout the world, why hasn't there been a concerted effort from governments to create the policy environment for scaling up these approaches globally?
- Do subsidies of fertilizer and other non-green inputs necessarily harm the sustainability of smallholder agriculture?
- Can green approaches – such as conservation agriculture, sustainable forest management and integrated pest management – be applied universally? What are the barriers to their implementation?
- Do land acquisitions by private entities affect the adoption of sustainable agriculture?
- What are the key gaps in our knowledge of green technologies, and how can we facilitate more research and development to fill them?
- What sources of finance are available to leverage the adoption of sustainable agricultural intensification approaches, and how can we ensure it reaches smallholders in an efficient and timely manner?
- How can public-private partnerships be promoted and used to drive green growth for smallholders? How can value chains be harnessed as pathways to scale up sustainable agriculture?

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