

IISD Food Security and Climate Change Initiative

*Addressing Financing for Agriculture:
Ensuring a triple dividend for smallholders*

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Preface

A critical challenge facing the world is how to feed an expected population of around 9 billion by 2050, while simultaneously reducing greenhouse gas (GHG) emissions and adapting to climate change.

The agricultural sector plays a critical role in food security, poverty reduction and economic growth—especially in developing countries, where agriculture is fundamental to sustainable development. Agricultural systems are very sensitive to changes in climatic conditions and will have to adapt if they are to ensure provision of adequate food for an increasing population. The sector is a large emitter of GHGs, responsible for around 14 per cent of global emissions, and has significant potential to sequester atmospheric carbon dioxide and reduce GHG emissions. In this respect, actions in the agricultural sector within the international climate change regime potentially can strengthen adaptive capacity and reduce GHG emissions while improving food security and enhancing rural livelihoods.

With the support of Canada's International Development Research Centre, the International Institute for Sustainable Development (IISD) launched the Food Security and Climate Change Initiative to help promote the triple dividend within the context of the United Nations Framework Convention on Climate Change (UNFCCC). IISD's research, policy and practice aims to inform the inclusion of agriculture in a future international climate change agreement in a way that encourages the triple dividend.

The series of policy reports focus on the following themes:

Agriculture and the UNFCCC Negotiations

- *Agriculture in an International Climate Change Agreement*
- *Agriculture and Climate Change: Post-Durban Issues for Negotiators*

Achieving the Triple Dividend: Perspectives on linking adaptation and mitigation in practice

- *Encouraging a Triple Dividend: Increased Food Security, Improved Adaptive Capacity and Reduced Emissions*
- *Integrating Mitigation and Adaptation in the Agricultural Sector*

Critical Issues for Agriculture Moving Forward

- *Addressing Financing for Agriculture: Ensuring a Triple Dividend for Smallholders*
- *Agriculture and Trade*

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Table of Contents

Preface.....	iii
1.0 Introduction	1
2.0 The Importance of the Triple Dividend for Smallholders	1
3.0 The Need for Financing for the Triple Dividend	3
4.0 Triple Dividend Financing Options	4
4.1 Public Financing	4
4.1.1 International Development Assistance	4
4.1.2 Microfinance Institutions.....	6
4.1.3 National Governments.....	7
4.2 Private Sector	8
4.3 Climate Financing.....	9
4.3.1 UNFCCC Financing	9
4.3.2 Climate Funds Outside of the UNFCCC	12
4.3.3 Carbon Markets	13
5.0 Key Observations.....	16
6.0 Recommendations for Policy-Makers and Negotiators	17
References.....	20

Abbreviations and Acronyms

AfDB	African Development Bank Group
CDM	Clean Development Mechanism
COP	Conference of the Parties
EU-ETS	European Union Emissions Trading System
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
G-8	Group of Eight
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	greenhouse gas
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
LDCF	Least Developed Countries Fund
MFI	microfinance institution
NAMA	nationally appropriate mitigation actions
NAPA	National Adaptation Programme of Action
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
PES	Payment for Ecosystem Services
PoA	Program of Activities
REDD+	Reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change

1.0 Introduction

This International Institute for Sustainable Development (IISD) policy report provides an overview of the potential options for increasing smallholder agriculturalists' access to financing that will help them achieve the triple dividend of enhanced food security, increased resilience to climate change, and reduced emissions of greenhouse gases (GHGs). To identify and promote financing mechanisms appropriate for achieving a triple dividend by smallholders, this paper explores key questions:

- Why is financing required to promote the engagement of smallholder farmers in triple-dividend agricultural practices?
- What are the existing mechanisms through which financing is or could be delivered, and the strengths and limitations of each in providing benefits to smallholders?
- How might financing best be directed so as to help smallholders in developing countries achieve the triple dividend moving forward?

In answering these questions, this policy report identifies the challenge before the international community, the financing needs of smallholders, current sources of financing and mechanisms for delivering these funds. It concludes by providing a number of suggestions to mobilize additional investment that will enable further progress towards the realization of a "triple dividend" in agriculture activities.

2.0 The Importance of the Triple Dividend for Smallholders

By 2050, the world's population is expected to be around nine billion. To meet the needs of this growing population, as well as the more than one billion people that are currently undernourished, it is projected that food production will need to grow by 70 per cent globally and almost 100 per cent in developing countries (Food and Agriculture Organization [FAO], 2009, p. 1). This increase will need to take place in a changing and likely unpredictable climate. Ensuring food security under these circumstances will require a significant shift towards flexible, robust and sustainable production systems that are better able to adapt to anticipated and unanticipated climate risks.

Making this change is particularly important in developing countries, many of which continue to struggle to achieve or maintain national food security.¹ Of critical concern are the observations that:

- Agriculture productivity is projected to decline in many parts of the developing world. Per capita, food production is already declining in sub-Saharan Africa (Grainger-Jones, 2011), and rainfed crop yields in some African countries are projected to decline by 50 per cent by 2020 due to climate change (International Fund for Agricultural Development, 2012, p. 12).
- The poor in developing countries are widely acknowledged to be among the most vulnerable to the impacts of climate change. Degraded ecosystems, weak governance institutions, underdeveloped economies and limited human and technical capacity impede their capacity to cope with current climate variability and increase their vulnerability to climate change.

¹ In 2011, 26 countries—mostly situated in sub-Saharan Africa and South Asia—suffered extremely high levels of hunger. This statistic is based on the Global Hunger Index, which measures hunger by three indicators: undernourishment, child underweight and child mortality. It weighs 122 countries on a 100-point scale, where zero equates to no hunger and 100 is the highest level of hunger (von Grebmer et al., 2011).

Given the importance of the agricultural sector for local livelihoods, national economies and food security, it is unsurprising that this sector is a key priority for many developing countries.

While the agricultural sector is vulnerable to the impacts of climate change, it is also the source of about 14 per cent of global GHG emissions. The bulk of these emissions are emitted at the farm level, as opposed to manufacturing and transportation (Wollenberg, Tapio-Biström & Grieg-Gran, 2012). Approximately three quarters of agricultural GHG emissions are generated in low- and middle-income countries. They are growing most rapidly in developing countries, increasing by approximately 35 per cent between 1990 and 1998 (Smith et al., 2007). This pattern is projected to continue over the next 30 years; as incomes grow, agricultural production intensifies and consumption of meat and dairy products rises (Wollenberg et al., 2012). At the same time, with the proper incentives, the agricultural sector could play a significant role in climate mitigation. It is estimated that the technical mitigation potential from agricultural production could reach 5.5 to 6.0 gigatonnes of carbon dioxide equivalent per year by 2030 (Smith et al., 2007).²

As developing countries seek solutions to development and climate change challenges, attention will need to be given to the role smallholder farmers, given that:

- **The majority of farms worldwide are classified as small in scale.** About 404 million of the estimated 525 million farms worldwide³ are held by smallholder farmers, when “smallholder” is defined as farmers who own two hectares of land or less (World Bank, 2007).⁴
- **Smallholders play a critical role in promoting food security** (African Development Bank Group [AfDB], 2010), providing up to 80 per cent of the food available in developing countries (Grainger-Jones, 2011, p. 3). Yet they also constitute the largest share of undernourished people in the developing world (Grainger-Jones, 2011).
- **Smallholder farmers are among the most vulnerable to the impacts of climate change.** Many occupy marginal lands, lack secure tenure, rely on other climate-sensitive natural resources, and are members of marginalized groups (e.g., female-headed households and indigenous peoples).

A critical challenge for the international community, therefore, is creating the enabling environment that will encourage smallholders to alter their agricultural practices so as to provide the triple dividend of increased food production, strengthened adaptive capacity and reduced GHG emissions. A key to creating this enabling environment will be providing (either directly or indirectly) the financing needed to help smallholders overcome the barriers to their greater participation in sustainable agricultural production.

² Technical mitigation potential is measured through consideration of several activities, including soil carbon sequestration, mitigation of methane and mitigation of soil nitrogen dioxide.

³ On a regional basis, approximately 87 per cent of farmers in Asia and 80 per cent of farmers in Africa can be classified as smallholders (Havemann & Muccione, 2011).

⁴ Smallholders can also be defined in terms of additional factors, such as their reliance on household labour, assets and access to resources, including markets (Havemann & Muccione, 2011).

3.0 The Need for Financing for the Triple Dividend

Achieving the triple dividend in the agricultural sector will require significant new financing:

- *For food security:* Achieving food security for all will require approximately US\$210 billion in annual investments (mostly from private sources) in developing countries between 2005 and 2050, just in primary agriculture and downstream services (FAO, 2009; FAO, 2010). The costs imposed by climate change would be additive (Schmidhuber, Bruinsma & Boedeker, 2009).
- *For adaptation:* Financing adaptation to climate change within the agricultural sector could cost US\$14.0 billion per year by 2030, of which half could be required by developing countries (Smith et al., 2007; Grainger-Jones, 2011, p. 6; FAO, 2010). This estimate is likely conservative; the cost of adaptation in the agricultural sector could in fact be two to three times greater (Grainger-Jones, 2011).
- *For mitigation:* To enhance the capacity of the agriculture sector to mitigate climate change, an additional investment of about US\$9.6 billion for crops and US\$3.2 billion for livestock will be needed in developing countries in 2030—not including the cost of reducing carbon dioxide emissions (UNFCCC, 2007), such as through soil carbon sequestration (FAO, 2010).

Throughout the world, numerous governments and organizations are testing practices that have the potential to increase food production, enhance climate resilience and/or reduce GHG emissions. Two key observations are emerging. First, many agricultural activities that promote greater food production can also help farmers increase their resilience to climate change and have benefits with respect to climate mitigation (McCarthy, Lipper, Mann, Branco & Capaldo, 2012; Wollenberg et al., 2012).⁵ Second, while many climate-smart agricultural interventions are well known and technically feasible, a large gap exists between their potential and actual implementation by smallholder farmers (Wollenberg et al., 2012). Most prominently is the limited capacity of smallholder farmers to make the upfront investment and absorb the opportunity costs associated with a change in practice, even in the short term. Well-designed financing instruments that provide additional support during the initial stages of adopting a new approach or technology can help smallholders overcome this barrier.

Catalyzing the change needed to achieve the triple dividend must therefore involve scaled-up financing, while drawing upon the existing technical and experiential base to overcome the barriers that currently prevent smallholders from adopting new practices.

⁵ See the papers in the IISD series entitled *Encouraging a Triple Dividend in Agriculture: Increased Food Security, Improved Adaptive Capacity and Reduced Emissions* and *Integrating Mitigation and Adaptation in the Agricultural Sector* for a more detailed discussion of specific agricultural interventions that are considered “climate-smart.”

4.0 Triple Dividend Financing Options

At present, large financial flows for agriculture have not yet been realized, leaving a significant gap between current and desired levels of investment. Closing this gap will require the leveraging of additional funds from three key financing channels:

- Public financing of agriculture, either from domestic or international sources
- Private financing through local and foreign investment in agriculture
- Climate financing derived from a combination of public and private sources

The objective function of financing the triple dividend is to ensure that existing and new financial flows are oriented to aid smallholder farmers and promote approaches that will bring about multiple or bundled long-term development, adaptation and mitigation co-benefits.

4.1 Public Financing

Public expenditures—both foreign and domestic—play a key role in many aspects of agricultural investment that impact smallholders. Public funds finance agricultural research, education, policy development, microfinance, water supply and are used to leverage private financing and encourage investment in developing countries. Support structures such as rural infrastructure and social services are also largely financed by public funds. The delivery of international and national funds to the agricultural sector occurs through a variety of channels, some of which are or could be used to better enable smallholders to increase production while supporting climate change mitigation and adaptation, as discussed below.

4.1.1 International Development Assistance

Investments in developing countries aimed at increasing the productivity of the agriculture sector have proven to be at least twice as effective in reducing rural poverty and contributing to food security over investments in all other sectors (AfDB, 2010). Yet, since the 1980s, official development assistance (ODA) investment in the agricultural sector⁶ has declined in real and relative terms—declining as percentage of ODA by about 58 per cent between 1980 and 2005, while overall provision of ODA increased by 112 per cent. The share of agricultural investment from bilateral ODA fell to 3.8 per cent in 2006, but increased slightly to around 5 per cent in 2009 (FAO, 2009, p. 3)⁷ following the 2007 to 2008 global food crisis. A number of international initiatives focused on agriculture have also been launched in recent years, such as the United Nations Secretary General’s High Level Task Force on the Global Food Security Crisis, the Committee on World Food Security, and the Group of Eight’s (G-8) L’Aquila Food Security Initiative of 2009. These initiatives have raised the profile of agriculture and brought the need for improved funding and policy mechanisms to the fore.⁸

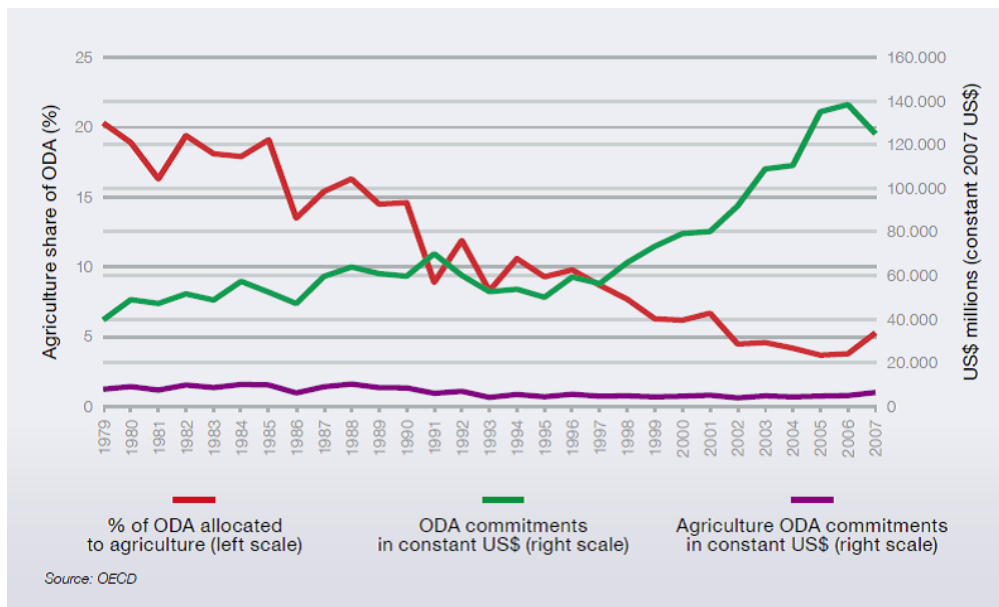
⁶ Agriculture-focused international financial assistance to developing countries is provided through a variety of mechanisms, including: bilateral assistance, such as through agriculture and rural development programs and direct budgetary support; multilateral agencies, such as the FAO, International Fund for Agriculture and Development, the World Bank’s International Development Association, United Nations Development Program and the Consortium of International Agricultural Research Centers; and targeted international funds, such as the Global Agriculture and Food Security Programme and the Global Food Crisis Response Programme.

⁷ Funding for smallholder agriculture was estimated to be US\$12 billion in 2010, or the equivalent of 2.2 per cent of the aid budgets of 29 donors. Africa received the majority of this funding. Assistance was provided primarily to support training and the provision of inputs, followed by increasing access to markets and finance, and improving infrastructure (Pfitzer et al., 2010, cited in Havemann & Muccione, 2011, p. 22).

⁸ For a full list of ongoing international Food Security Initiatives, see Annex 2 of Meridian Institute’s 2011 report, *Addressing Agriculture in Climate Change Negotiations: A Scoping Report*.

While ODA for the agricultural sector has risen in recent years, only a limited proportion has specifically targeted climate change. A review of 2008–2009 support for agriculture (including forestry and fisheries) and rural development by members of the Organisation for Economic Co-operation and Development’s (OECD) Development Assistance Committee found that US\$0.78 billion of the US\$7.42 billion invested in this sector (or 10.5 per cent) identified climate change mitigation⁹ as being a principal or significant objective (OECD, 2011). The limited extent to which ODA for agriculture is used to finance climate mitigation in part reflects expectations that climate financing will be “new and additional,” and therefore will not divert funding for development. However, it is recognized as appropriate to use ODA for climate adaptation and mitigation activities that create an enabling environment in which action can take place.¹⁰

FIGURE 1: ANNUAL ODA COMMITMENTS BETWEEN 1979 AND 2007: OVERALL TRENDS AND SHARE ALLOCATED TO AGRICULTURE



Source: OECD, from FAO (2009, p. 3)

Challenges:

- Opportunities to link new food security initiatives to climate change action have been missed. For example, only a limited proportion of the US\$22 billion in funding committed to under the 2009 L’Aquila Food Security Initiative¹¹ and distributed through the Global Agriculture and Food Security Program has specifically been linked to climate change. Of the 22 per cent of this funding commitment disbursed as of May 2011 (G-8, 2011), very little is specifically focused on climate change.

⁹ Markers for tracking expenditures on climate change adaptation have only recently been launched by the OECD, beginning with information from 2010.

¹⁰ ODA therefore can be used to finance capacity building, information provision, technology access and “to cover upfront expenditures necessary for making changes in agricultural production systems that support both food security and climate change objectives” (FAO, 2010, p. 27).

¹¹ Under the 2009 L’Aquila Food Security Initiative, G-8 leaders committed to mobilizing US\$22 billion in financing between 2009 and 2011 through a “coordinated, comprehensive strategy focused on sustainable agriculture development,” while maintaining additional commitments to emergency food aid assistance (G-8, 2009).

- The ability of developed countries to increase their provision of ODA is limited by a reluctance to increase domestic taxation and/or to allocate a greater proportion of public revenue to meeting international development needs rather than domestic needs.

Opportunities:

- A growing number of countries are engaged in development assistance. These countries include new members of the European Union (e.g., Czech Republic and Hungary), other Northern countries (e.g., Russia and Israel), emerging developed countries engaged in South-South cooperation (e.g., Brazil, China, Columbia, Egypt, India, South Africa and Thailand) and Arab donors (e.g., Kuwait, Saudi Arabia and the United Arab Emirates). The OECD estimates that these countries provided between US\$12 and \$14 billion in development assistance in 2008¹² and that the volume of assistance from these countries is growing (Smith, Fordelone & Zimmermann, 2010). These emerging donors could be encouraged to direct a greater portion of their funds to shared concerns within the agricultural sector.
- Greater consideration of climate change benefits in the Global Agriculture and Food Security Program and similar existing and future global initiatives. Many existing global initiatives have the scope to encourage “climate-smart” practices, and support the adaptation and/or mitigation co-benefits associated with these actions.

4.1.2 Microfinance Institutions

Microfinance institutions (MFIs), in their various forms, primarily provide small business loans that are to be repaid over a period of about six to twelve months. The majority of MFIs “source part of their funding, directly or indirectly, from multilateral development agencies” (Havemann & Muccione, 2011, p. 20). MFIs help to fill a financing gap found in many developing countries, where lending by commercial banks to the agricultural sector is small¹³ (FAO, 2009, p. 3) and very little of this financing reaches smallholders; only about 6 per cent of smallholder farmers in most agricultural regions of Africa and South Asia have access to banks (Bachelier, 2007). Properly oriented, rural and microfinance institutions could play a stronger role in linking “top-down” and “bottom up” approaches to financing, helping to provide smallholders with the access to the financing they need to initiate new agricultural approaches.

Challenges:

- Existing rural and microfinance mechanisms have been observed to have a disproportionate focus of lending towards high-value export crops, and to place priority on a threshold of production size and type that may exclude smallholders (Havemann, 2011). As such, the full potential of microfinance and other similar approaches have not been met due to persistent access, transaction cost and information challenges.

Opportunities:

- Increasing the level of financing allocated to microcredit and low interest loans could lower high commercial interest rates and thereby make credit more available and affordable for smallholders (Streck, Burns & Guimaraes, 2011).

¹² If these funds met the OECD’s requirements for official development assistance, this amount of funding was equivalent to 9 to 10 per cent of global ODA in 2008 (Smith et al., 2010).

¹³ In sub-Saharan Africa, for example, less than 10 per cent of commercial lending is to the agricultural sector (FAO, 2009, p. 3)

4.1.3 National Governments

National governments play a critical role in creating a positive climate for rural producers, domestic businesses and international actors to make investments that benefit smallholders (FAO, 2009; Streck et al., 2011). To strengthen agricultural systems and improve food security, public funding is needed for agricultural research and development, improving the management of natural resources, and strengthening support systems such as extension services, markets, transportation corridors and access to energy (FAO, 2009). However, spending by national governments on agriculture is relatively low—varying among developing countries from being as low as 4 per cent in many countries in sub-Saharan Africa,¹⁴ to upwards of 10 per cent in many major developing economies (World Bank, 2007). The remainder of public investment in the sector is provided through ODA (FAO, 2010).

Challenges:

- The ability of many developing country governments, particularly those of the least-developed countries, to increase the proportion of their national budget allocated to expenditures on the agricultural sector is limited by their weak economic situations and need to address competing demands in a range of other sectors.
- Should financing for agriculture significantly increase in the near term, the ability of some developing countries, particularly the least-developed countries, to absorb these funds could be limited. Weak governance mechanisms and limited management expertise limit the absorptive capacity of some countries.

Opportunities:

- Financing could ensure that domestic policies encourage (or, at a minimum, do not discourage) the directing of new and existing agricultural investments towards activities that enable smallholders to achieve the triple dividend. Relevant public policies include those related to land tenure systems, lending arrangements, infrastructure development, taxation policies, training programs and research and development (FAO, 2009; Streck et al., 2011).
- Greater institutional coordination within national governments could enable better identification of mitigation, adaptation and food security synergies and trade-offs, allowing existing and new funding to be used more effectively. In some countries, achieving this goal will require additional investment in building the capacity of existing institutions, and potentially the creation of new institutions.
- Reforming and/or modernizing extension services could better enable them to efficiently provide technical support to smallholders. As well, it could enhance local and central agricultural staff's understanding of the triple dividend, practices that support its achievement and effective processes for engaging smallholders (Streck et al., 2011). This investment will help create the enabling environment needed for climate-smart agriculture.
- Establishing funds at national and/or subnational levels will provide smallholders with grants or loans that will cover the initial, upfront cost associated with adopting a new practice. Such funds could also be used to finance aggregation of farmers, establish monitoring systems, build awareness of financial institutions, train extension staff, and other activities that reduce the barriers facing smallholders (Streck et al., 2011). Funding could originate from domestic or international sources, and could be delivered directly or through cooperatives and farmers groups.

¹⁴ In developing countries with agriculture-based economies, the sector can generate 29 per cent of GDP and provide employment to 65 per cent of the labour force, but still only be the recipient of spending equivalent to 4 per cent of agricultural GDP (World Bank, 2008, cited in FAO, 2010, p. 26).

4.2 Private Sector

The private sector (local and international) plays a critical role in agricultural investment, accounting for two thirds of global investments and financial flows (Streck et al., 2011). These investments are made directly in agricultural production and indirectly in agricultural infrastructure and other value-chain assets, including transportation. The majority of current private investment comes from domestic sources (FAO, 2010; Smith et al., 2007), with smallholders receiving financing from family, friends, local organizations and remittances (Havemann & Muccione, 2011). Foreign direct investment (FDI) is also a significant source of financing, with FDI in agriculture production globally tripling between 1990 and 2007, from less than US\$1 billion to \$3 billion (United Nations Conference on Trade and Development, 2009).¹⁵ FDI stems primarily from developed countries (particularly the European Union and North America) (Meridian Institute, 2011), but emerging developing countries (such as China and India) are playing a growing role. A spike in FDI in the agriculture sector—often with the financial backing of governments and sovereign wealth funds—occurred in 2008 due to concerns about food security, growing demand for biofuels and the financial crisis (Smaller, 2012). These investments often involved the purchase or long-term lease of land,¹⁶ but also included contract farming and outgrower schemes (Hallam, 2009).

Given the private sector's dominant role in financing agricultural activities, it must be a key actor in efforts to encourage the shift towards practices that promote the triple dividend. It may act directly by financing desired practices or indirectly by providing technology and knowledge (Streck et al., 2011). For these investments to take place, the private sector must anticipate benefits such as improved sustainability of product supply lines and portfolio diversification.

Challenges:

- Although FDI in developing countries is significant, “smallholder farmers hardly benefit from these investment flows” (Streck et al., 2011, p. 32). FDI has been criticized for primarily supporting highly mechanized forms of agricultural production that generate few employment opportunities, increase dependence of imported inputs, and promote practices that degrade the environment and deplete water resources (Hallam, 2009).
- Private sector support for smallholders is primarily directed towards those engaged in the production of goods to be sold in domestic urban centres or on the international market (Havemann & Muccione, 2011). It therefore engages with only a portion of smallholders and typically does not actively support subsistence agriculture production.
- Concerns have been expressed that the recent increase in FDI in developing countries has supported land grabs, production of liquid biofuels, conversion of smallholder practices to industrial agriculture and could potentially lead to the repatriation of food produced to the investing country (Hallam, 2009)—each of which has the potential to increase food insecurity.

¹⁵ The majority of this investment supported the production of major row crops (such as corn, wheat and feed grains), livestock production, and, to a lesser extent, multi-season crops such as sugar cane (UNCTAD, 2009).

¹⁶ According to the World Bank, deals for 45 million hectares of land took place in 2009, with investors particularly targeting countries with “weak land governance and often in conflict or post-conflict situations” (Smaller, 2011, p. 1).

Opportunities:

- Funding could encourage investment in agriculture by tapping into the increasing flow of remittances to developing countries. The Diaspora Investment in Agriculture Initiative recently launched by the International Fund for Agriculture and Development and the United States Department of State (Havemann & Muccione, 2011) provides an example of this approach.
- Private sector funding could promote greater investment in the sustainability of supply chains, particularly given the private sector's capacity to provide farmers with technical support (Streck et al., 2011; Wollenberg et al., 2012). This could include the integration of mitigation and adaptation considerations into contract farming arrangements (Havemann & Muccione, 2011).
- Labelling and certification programs that support smallholders could be expanded. Few of these programs currently explicitly address climate change concerns and could (in theory) provide around US\$10.5 billion annually in new finances.¹⁷ The private sector could also assist smallholders to participate in these programs by covering the cost of certification and reducing transaction costs (Streck et al., 2011).¹⁸
- The private sector's role in (micro-) lending could increase, for example, through governments (using domestic or international funds) providing incentives (Havemann & Muccione, 2011) and supporting capacity building in areas such as contract negotiations (Streck et al., 2011).
- Insurance could be provided that covers the cost of any potential declines in production associated with transitioning to climate-smart agricultural activities (Streck et al., 2011).

4.3 Climate Financing

Along with traditional public and private investment flows into the agricultural sector, climate-focused financial flows could provide opportunities for achieving the triple dividend. Developed countries have committed to making available a total of US\$30 billion in fast-start financing between 2010 and 2012; and to mobilizing US\$100 billion annually by 2020. This climate-focused financing is expected to be channelled through existing and emerging mechanisms under the UNFCCC, climate funds established outside of the UNFCCC and the carbon market. Directing at least a portion of these flows toward agricultural activities that provide multiple benefits for smallholders could play a strong role in efforts to address both climate change and food security concerns. At present, however, the success of existing climate financing mechanisms in achieving these goals is limited.

4.3.1 UNFCCC Financing

Agriculture has always been part of the UNFCCC; its ultimate objective is to stabilize GHG concentrations in the atmosphere at a level that, in part, will ensure that food production is not threatened (United Nations, 1992). However, agriculture was only "officially" recognized as an area for formal negotiations during the 17th Conference of the Parties (COP) to the UNFCCC in Durban, South Africa, in December 2011. The outcomes of these negotiations may lead to greater opportunities to finance achievement of the triple dividend.¹⁹

¹⁷ It is estimated that retail sales of certified agricultural and forest products could reach US\$20 billion by 2020, up from over US\$42 billion (Parker & Carnford, 2010, cited in Streck et al., 2011, p. 34).

¹⁸ Voluntary standards such as the Climate, Community and Biodiversity Standard (www.climate-standards.org) and Social Carbon Methodology (www.socialcarbon.org) could be used to inform these schemes.

¹⁹ See the papers in the IISD series entitled *Agriculture in an International Climate Change Agreement* and *Agriculture and Climate Change: Post-Durban Issues for Negotiators* for discussion on the dynamics around, and outcomes of COP 17 related to agriculture.

At present, the agricultural sector is already being supported through a few existing UNFCCC financing mechanisms. Prominent among these is the Clean Development Mechanism (CDM) established under the Kyoto Protocol (see section 4.3.3 below). Outside of the CDM, the majority of existing financing opportunities focus on adaptation, namely:

- The Least Developed Countries Fund (LDCF) established to support the Least Developed Countries work programme, particularly the development and implementation of National Adaptation Programmes of Action²⁰ (NAPAs)
- The Special Climate Change Fund, which supports adaptation and technology transfer in all developing countries
- The Adaptation Fund, which is open to developing country parties to the Kyoto Protocol and became operational in 2010

Each of these existing funding streams supports adaptation within the agricultural sector. For example, 39 per cent of funded NAPA projects (the largest share) are focused on food security and agriculture (Global Environment Facility [GEF], n.d.1). However, the amount of funding committed (even taking into account additional project funds leveraged from other sources) to these funds is a fraction of the World Bank estimate of US\$2.5–\$2.6 billion per year in adaptation funding needed between 2010 and 2050 (FAO, 2010). With respect to the LDCF: as of December 2011, US\$217 million in funding had been approved—including about US\$105.7 million for agriculture—since 2001 (GEF, n.d.1). Similarly, since 2010, the Adaptation Fund has approved US\$115 million in project funding; nearly one quarter of this amount is directed to projects focused on adaptation in the agricultural sector (Adaptation Fund, 2012).

Some emerging UNFCCC funding mechanisms might provide new opportunities to significantly scale-up the provision of funding for climate change activities within the agricultural sector:

- *Nationally appropriate mitigation actions (NAMAs)* - Within the UNFCCC, NAMAs have become the main vehicle for discussions of country-specific mitigation efforts in developing countries, often with the support of developed countries. There has been increasing momentum and willingness on the part of many developing countries to engage in NAMAs, and many developed countries also support their development because, in many cases, they can provide offset and financing opportunities. Given the importance of agriculture to developing countries, it is not surprising that many have included agricultural activities in their NAMAs to date. As of January 2012, the United Nations Environment Program-Risøe (UNEP-Risøe) NAMA Pipeline included 19 (of 104) projects focused on agriculture and forestry (UNEP-Risøe, 2012a).²¹ The inclusion of agriculture presents a number of country-driven opportunities to increase investment in the sector. However, the full scale of financing remains unclear and progress on NAMAs may ultimately be tied to overall progress in the international negotiations.

²⁰ Examples of NAPA projects focused on agriculture include: (1) Strengthening Climate Resilience and Reducing Disaster Risk in Agriculture to Improve Food Security in Haiti Post Earthquake, a project approved in March 2011 that seeks to build capacity to upscale good farming practices, raise awareness of climate change risk for crop production and opinions for adaptation practices; (2) Strengthening Farming Communities Livelihoods Resilience against Climate Change in the Guinean Prefecture of Gaoual, Koundara and Mali, a project that aims to reduce vulnerability and increase adaptive capacity via climate-resilient rural development; and (3) in Lesotho, the Adaptation of Small-Scale Agriculture Production project, approved in December 2011, which seeks to reduce the vulnerability of agricultural production through actions such as mainstreaming adaptation into local level agricultural planning and increasing the adaptive capacity of small-scale farming systems.

²¹ Examples of agriculture-focused NAMAs include: (1) Costa Rica proposes to implement a strategic plan that focuses on reducing GHG emissions of the agricultural sector by up to 15 per cent through the introduction of mitigation technologies in the coffee sub-sector and (2) Indonesia plans to implement a project focused on re-flooding peatlands by installing new and better management of existing water gates (Ecofys, 2012).

- *Reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+)* – While there is increasing appreciation that REDD+ policies will not be successful if agriculture is not addressed (due to its role as a driver of deforestation), many parties are reluctant to link these two issues together for fear that it will stall progress on already agreed-upon elements of REDD+. Despite this situation, agriculture could indirectly benefit from REDD+ financing and activities if it is included as part of broader country-level strategies. REDD+ financing is expected to only be available to countries with rich carbon forests, and therefore will not be a viable financing mechanism for a number of developing countries.²²
- *Green Climate Fund (GCF)* – Agreed to during the Copenhagen Climate Change Conference in 2010, a significant portion of developed countries’ US\$100 billion by 2020 commitment is expected to be directed through the GCF. Modalities agreed to during COP 16 in Cancun helped to further define the scope of the GCF, but a number of critical details remain to be determined. Among these issues is the number of financing windows that will be available under the GCF. The fund is anticipated to contain at least two windows—one for mitigation and one for adaptation—but the potential opening of additional “cross-cutting” or integrated windows such as for agriculture is being discussed. Full operationalization of the GCF faces a number of challenges and its start-up date is unclear.

Although these emerging financing mechanisms present opportunities for the agricultural sector, care will be needed to ensure that their potential is realized. Drawing upon experiences gained through the implementation of existing UNFCCC funds, a holistic approach will need to be adopted to ensure that mitigation and adaptation silos are avoided. The establishment of only two windows within the GCF, for example, could mean that neither window provides a suitable entry point for financing agricultural activities that provide both mitigation and adaptation benefits. Greater emphasis will also need to be given to the types of actions to be financed, rather than just to the architecture of the funding mechanism (FAO, 2010). As well, greater clarity will need to be provided regarding the “division of labour” between public and private sector financing to support these mechanisms. Significant financing is expected to be mobilized from private sources, with little understanding of what this actually means or how such funding is to materialize.

Challenges:

- Although developing countries have become increasingly involved in decision-making related to the operation of existing UNFCCC climate funds, and have achieved milestones such as direct access under the Adaptation Fund, there is still progress to be made. Greater influence by developing countries, particularly lower-income developing countries, over these funds could potentially lead to agriculture’s greater prominence within their portfolios.
- There is concern that challenges related to the current rate and scope of the UNFCCC negotiations could render potential new mechanisms ineffectual in the short term as significant sources of climate financing.

²² For example, REDD+ therefore will not provide a viable funding window for countries with extensive dryland savannah regions, such as in sub-Saharan Africa, that are also often food insecure.

Opportunities:

- UNFCCC financing could ensure support for agriculture through the GCF, either by establishing a window dedicated specifically to supporting this sector or by prioritizing those actions that provide mitigation and adaptation benefits.
- Funding could support the continued development of agriculture-related NAMAs, as prioritized by developing countries. There are opportunities for technical and policy capacity building, particularly related to the design of country-specific NAMAs that can benefit smallholders.

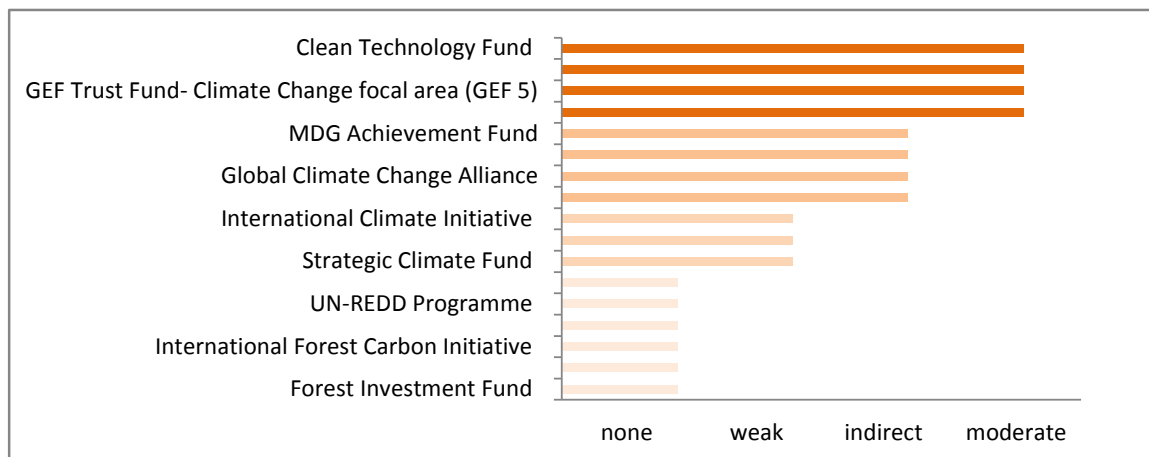
4.3.2 Climate Funds Outside of the UNFCCC

Recent statistics from the OECD indicate that climate-related bilateral aid to developing countries totalled US\$22.9 billion in 2010, or about 15 per cent of all official development assistance.²³ Of this total:

- US\$17.6 billion was spent on aid for which climate mitigation was a principle or significant objective, of which 8 per cent was spent on agriculture and rural development (~US\$1.4 billion)
- US\$9.3 billion was allocated to adaptation-related actions, of which 21 per cent was spent on agriculture and rural development (~\$US1.95 billion) (OECD, 2012a)²⁴

These figures demonstrate that a sizeable portion of donor financing for climate change occurs outside the formal UNFCCC mechanisms. Over and above funding delivered through direct bilateral aid (e.g., Germany’s International Climate Initiative and the Nordic Development Fund’s ProClimate Facility), financing is also directed towards a number of international climate change funds. However, as noted in Figure 2, less than one-quarter of the 17 international funds listed appear to provide moderate support to the agricultural sector; none primarily focus on the sector.

FIGURE 2: DEGREE OF SUPPORT FOR AGRICULTURAL ACTIVITIES BY SELECTED MULTILATERAL CLIMATE FUNDS



Derived from *Climate Funds Update* (<http://www.climatefundsupdate.org/listing>)

²³ These figures include contributions to the UNFCCC funds previously described (OECD, 2011).

²⁴ Care needs to be taken with these figures, as some allocations are double-counted; for example, 17 per cent of climate-related expenditures supported initiatives that provided both mitigation and adaptation benefits (OECD, 2012a).

Climate financing is also provided to a number of recently established national-level trust funds, such as the Bangladesh Climate Change Resilience Fund, the Maldives Climate Change Trust Fund, Indonesia Climate Change Trust Fund and Brazil's Amazon Fund. These funds are supported to varying extents by development assistance as well as contributions by developing countries themselves. The establishment of these funds provides developing countries with greater national ownership and the potential to better integrate climate change actions with national development policies and programs (FAO, 2010). The degree to which these funds will be used to support climate-related action in the agricultural sector remains to be seen.

Challenges:

- The goals and objectives of many of the major international climate funds have largely been set by developed countries. Their areas of focus, therefore, are more likely to reflect the drive by developed countries for GHG reductions than developing countries' interests in building resilience within the agricultural sector.

Opportunities:

- Processes that are more strongly driven by developing countries could ensure that needs within the agricultural sector are more fully reflected in the design and operation of new climate funds.
- Collective action by developed and developing countries, either bilaterally or multilaterally, could be taken to leverage existing or new climate funds outside of the UNFCCC that specifically aim to address the intersection of food security, climate change adaptation and climate change mitigation.

4.3.3 Carbon Markets

Given the significant amount of funding required to address climate mitigation and adaptation needs, and the limited capacity of public finance to supply these funds, expectations are high that a large proportion of future climate financing will be mobilized through the carbon market. For example, the Intergovernmental Panel on Climate Change (IPCC) has estimated that US\$30 billion per year could be raised through the carbon market for agricultural mitigation in non-OECD countries (Smith et al., 2007). These investments, in turn, could leverage five times as much in additional funding (FAO, 2010, p. 28). While this estimate is based on a number of assumptions,²⁵ it points to the general potential of the sector to benefit from participating in the carbon market. Experiences to date with respect to compliance markets (such as the CDM and the European Union Emissions Trading Scheme [EU-ETS]) and various voluntary markets, however, demonstrate some of the barriers to realizing this potential.

The CDM established under the Kyoto Protocol limits agriculture-related projects to a narrow range of activities, including methane avoidance (manure management), biogas projects and the use of agricultural residues for biomass energy (FAO, 2010; Seeberg-Elverfeldt, 2010). Notably, soil carbon sequestration (the largest potential source of agricultural mitigation) is excluded from the CDM (FAO, 2010). Thus far, only two agriculture-focused projects have entered the issuance stage of the CDM pipeline; no projects specifically within this sector have been registered. A larger number of CDM projects that indirectly connect to the agriculture sector have been registered, namely projects related to biomass (8.7 per cent), methane avoidance (6.4 per cent) and afforestation and reforestation (0.9 per cent).²⁶

²⁵ The IPCC estimate is based on mitigation in non-OECD countries through crops, grazing land improvements, organic carbon and degraded land restoration. These activities are expected to reduce GHG emissions by 1.5 gigatonnes of carbon dioxide equivalent per year, which was valued at US\$20 per tonne of carbon dioxide equivalent (FAO, 2010, p. 28).

²⁶ Percentage of a total of 4,170 registered projects as of June 1, 2012, included in the UNEP-Risøe CDM Pipeline. Biomass projects include those related to bagasse production, palm oil solid waste, biodiesel and agricultural residues from rice husks, mustard crop, poultry litter and other sources. Methane avoidance includes manure, domestic manure, palm oil waste and composting projects (UNEP-Risøe, 2012b).

Onerous accounting requirements and slow approvals are among the factors that have limited the development of CDM methodologies focused on agriculture (Wollenberg et al., 2012).²⁷

The EU-ETS is the main compliance market established outside of the UNFCCC system. Within the EU, the agriculture and forestry sectors are not covered by the EU-ETS due to the difficulties associated with accurately measuring emissions from the sectors (European Commission, 2008). The EU-ETS does support agricultural opportunities in developing countries through its inclusion of CDM credits. However, at present, this support is limited, in part because it does not accept temporary credits from afforestation and reforestation activities (which indirectly may benefit agriculture), but also because of the relatively limited degree to which agriculture has been incorporated in the CDM (as discussed above). The potential for future inclusion of agriculture in the EU-ETS is largely dependent on both technical advances in soil carbon measurement and the future of the CDM market in light of the uncertainties about the length and terms of the second commitment period to the Kyoto Protocol.

Beyond the compliance market, the voluntary carbon market²⁸ provides an alternative mechanism for financing agriculture. Within this market, carbon credits derived from land-use change projects comprise 46 per cent of the “over-the-counter” market share. This greater inclusion is reflective of the voluntary sector’s desire to specifically encourage these types of mitigation opportunities and their lower transaction costs (Streck et al., 2011). Still, the vast majority of land-based carbon credit projects involve REDD+ or avoided conversion of forests; in 2010, agricultural soil carbon sequestration and livestock methane projects constituted only 3 per cent and 2 per cent respectively of total transaction volume.²⁹ As well, relatively few credited agricultural projects were located in Asia (17 per cent) and Africa (8 per cent); the remainder were located in Latin America and the United States (Peters-Stanley, Hamilton, Marcello & Sjardin, 2011).

An additional type of market mechanism that has been used to provide carbon payments are Payment for Ecosystem Services (PES) schemes. Financed either by domestic or international, public or private sources, PES schemes provide an additional mechanism for delivering payments to farmers for continually engaging in climate-smart agricultural practices. Successful application of PES schemes, however, require the presence of strong institutions capable of monitoring compliance and making payments to a larger number of smallholders (Streck et al., 2011).

Challenges:

- Further research is needed to determine the full carbon sequestration potential of various agricultural practices. Significant research remains to be done on full life-cycle analysis and GHG accounting for different climate-smart agricultural practices. The mitigation benefits associated with these practices vary between agro-ecosystems and socioeconomic context, and need to be better understood if they are to be more fully integrated into GHG reduction strategies and, in particular, the global carbon markets (Smith & Wollenberg, 2012).

²⁷ As noted by Wollenberg et al. (2012, p. 12), 17 approved methodologies and 28 registered afforestation and reforestation projects related to smallholder agriculture had been approved by mid-2011.

²⁸ Examples of voluntary offset initiatives that support smallholders include the Voluntary Carbon Standard, Plan Vivo, the Gold Standard, and the Carbon Fix Standard (Havemann & Muccione, 2011).

²⁹ Agriculture constituted a similar proportion of activities within the voluntary market in 2009, with 3 per cent of transactions focused on agricultural soil management (about 1.32 million verified emission reductions) and 2 per cent on methane capture (about 0.88 million verified emission reductions) (Streck et al., 2011, p. 9).

- The slow accumulation of carbon due to sequestration activities means that initial returns to farmers are low (Havemann, 2011; Streck et al., 2011). Aggregation of a large number of small farmers is therefore needed—increasing transaction costs and limiting the agricultural sectors’ ability to compete against other sectors (Climate Focus, IIASA and UNIQUE GmbH, 2011; Havemann, 2011; Streck et al., 2011; Wollenberg et al., 2012).
- Current carbon standards generally place little emphasis on productivity and ensuring benefits for smallholders (Streck et al., 2011).
- Uncertainty regarding the future size and robustness of the CDM and the EU-ETS—and when these matters will be resolved—further limit the attractiveness of these mechanisms for leveraging agricultural financing. The future of the CDM will depend on the outcomes of the current negotiations on the second commitment period of the Kyoto Protocol. At present, it seems likely that the EU will be the only primary buyer in the second commitment period, potentially leading to an oversupply of certified emissions reduction credits. The extent to which the CDM presents a viable market could be further constrained if, as proposed, the EU only accepts CDM credits from least-developed countries after 2012.
- At this time, there appears to be limited appetite within the international community to develop new compliance markets, either at the regional or international levels, which could complement and/or augment the CDM and EU-ETS.

Opportunities:

- Greater inclusion of soil carbon sequestration as an eligible activity under compliance regimes would enable the carbon market to finance a number of different activities with the capacity to deliver a triple dividend. However, as noted above, a great deal of additional research, financing and capacity building is needed before this activity could become a viable carbon market option.
- CDM Program of Activities (PoA) allows bundling of CDM projects “to realise large-scale emission reductions, aggregate investments and reduce transaction costs” and thereby has the potential to better enable smallholders to participate in the carbon market (Streck et al., 2011, p. 9). As of June 2012, over 700 PoAs had been proposed. However, very few directly or indirectly are related to agriculture (UNEP-Risøe, 2012b). Factors limiting the inclusion of agriculture in CDM PoAs relate to challenges associated with the CDM itself, including the limited number of existing agriculture-focused CDM methodologies (Streck et al., 2011), high transaction costs and time lags. To overcome these constraints, incentives and national measurement, reporting and verification schemes could be provided by national governments (as part of NAMAs) to promote the scaling up of the PoA approach (Havemann & Muccione, 2011).
- Targeted funds could be established, either by the private sector or through international financing under the UNFCCC, to provide grants or loans to smallholders (either directly or through cooperatives and farmers’ organizations) to finance the upfront costs that currently prevent smallholders from participating in the carbon market (Streck et al., 2011). Loans could be repaid with future carbon credits (Grainger-Jones, 2011).

5.0 Key Observations

Significantly greater financing is required to facilitate the progress that will enable smallholder farmers to engage in practices that lead to achieving the triple dividend. Opportunities for achieving this goal exist through better incorporation of climate change concerns into existing and emerging climate financing mechanisms so that they can better provide multiple benefits. However, these opportunities are not yet being realized due to a number of different and significant challenges.

In seeking options for overcoming these challenges and augmenting the amount of financing currently directed towards the agricultural sector, the following observations should be kept in mind:

- ***There is no silver bullet solution or one-size-fits-all approach to financing.*** Meeting the unique needs of smallholders will require a diverse array of investments in areas such as: improved production, better insurance, improved infrastructure and stronger governance regimes. A single source of funding—whether public or private—will not be able to provide the adequate and sustainable support needed to meet these diverse needs. Rather, a combination of interlinked and mutually supportive sources of funding is required.
- ***Coordination between agriculture and climate change financing is limited.*** Traditional flows of investment into the agricultural sector (whether public or private) have yet to strongly integrate climate change considerations into their objectives and design. At the same time, little climate mitigation financing has been directed towards the agricultural sector, and even less has managed to reach smallholders. A greater proportion of financing for adaptation to climate change has targeted agriculture and food security, but the total amount of funding to date is relatively small. Greater integration of climate and agricultural financing, and between public and private sources, is required if the scale of funding needed to achieve the triple dividend is to be mobilized (FAO, 2010; Streck et al., 2011).
- ***Public sector financing for the agricultural sector is unlikely to increase in the near term.*** The ability of the international donor community to increase its provision of financing for developing countries is currently constrained by domestic economic concerns—a situation that is unlikely to change significantly in the near term. Nor are developing countries (particularly the least-developed countries) likely to significantly revise the orientation of their domestic investments such that they will finance achievement of the triple dividend.
- ***Private sector financing could be increased by the provision of appropriate incentives.*** Private sector investment could be increased by removing existing barriers, such as improving taxation systems and business registration processes. Careful attention will be needed to design incentives that specifically promote greater investment in those actions that are beneficial for smallholders and promote the triple dividend (such as those that encourage private sector entrance into the provision of micro-insurance and microcredit).
- ***The carbon market is currently not a viable option for significantly upscaling support for smallholders.*** Given the current challenges, neither the compliance nor voluntary carbon markets are likely to provide significant opportunities for encouraging smallholder farmers to achieve the triple dividend in the near term. As concluded by Climate Focus et al. (2011, p. 9), “a climate finance strategy for agriculture should focus first on lifting investment barriers and increasing incentives for sustainable agricultural intensification while considering carbon-market approaches for the future once enabling conditions are in place.”

- **Adaptation financing provides significant opportunity.** Building resilience within the agricultural sector has been prioritized by many developing countries in their NAPAs and national communications. Greater emphasis could be given to communicating the close connection between food security, adaptation and long-term development interests and integration of adaptation needs into existing public and private agricultural financing streams.
- **New sources of funding will be required.** Greater orientation of existing financial flows, along with improved coordination between these flows, could increase the amount of investment in the agricultural sector. However, this increase is unlikely to be sufficient to match the investment required to achieve food security for all, while mitigating and adapting to climate change. National governments instead need access to new sources of financing. While innovative financing mechanisms such as levies on financial transactions and air transportation have been widely discussed, and in some cases implemented,³⁰ the scope of their potential has not yet been realized. Willing developed and developing countries could explore opportunities for greater use of these mechanisms to finance climate-smart agricultural activities.

6.0 Recommendations for Policy-Makers and Negotiators

Achieving the triple dividend will require moving consideration of food security and climate change into the centre of agriculture policy setting, and the development of new financial mechanisms and public financing streams. To achieve these findings in light of the findings of this report, the following recommendations are presented for consideration:

- **Build on existing experience and knowledge.** For decades, local, national and international organizations have worked in diverse locations to promote the adoption of sustainable agricultural practices by smallholder farmers. These experiences have generated lessons learned regarding the most effective ways for engaging smallholders, the provision of financing to them and the barriers (institutional, cultural and financial) that prevent the adoption of new practices. To ensure their long-term sustainability and effectiveness, the wealth of knowledge within these organizations should be integrated into any strategic investments that aim to promote achievement of a triple dividend in the agricultural sector.
- **Prioritize achieving food security and resilience to climate change.** Reflecting the priorities of smallholder farmers, efforts to engage them in the achievement of the triple dividend should focus on increasing production, reducing poverty and enhancing food security. As achieving these goals depends in part on ensuring that interventions are climate resilient, suitable attention should be given to building the adaptive capacity of smallholders. Mitigation should be viewed as a significant co-benefit of these actions.
- **Create an enabling environment for climate-smart agricultural investment at the national level.** A significant constraint on improving agricultural productivity and attractive private sector (carbon) financing in developing countries, particularly in sub-Saharan Africa, is the absence of conducive policy environments, institutional arrangements and appropriate infrastructure (Hallam, 2009; Streck et al, 2011; Wollenberg et al., 2012). International financing could be used to help national governments overcome these constraints by targeting:

“Without theight policies in place, even significant investments pumped into the system will not necessarily bring the desired result.” (FAO, 2009. p. 4)

³⁰ See, example, the work of the Leading Group on Innovative Financing for Development: <http://leadinggroup.org/rubrique20.html>

- **Legislative and policy measures** that reduce barriers to investment, such as by clarifying access and tenure arrangements; improving land-use planning; modifying investment policies related to land use; providing financial incentives tailored to local circumstances; promoting market-based sustainability criteria; and removing taxes, subsidies or tariffs that create perverse incentives for unsustainable agricultural practices (Climate Focus et al., 2011; Streck et al., 2011)
- **Institutional strengthening** to enhance extension services and enable more coordinated action among government actors engaged in the agricultural sector
- **Critical infrastructure** needed to promote sustainable agricultural development, such as roads, weather stations and mobile phone networks (to enhance ICT-enabled access to remittances, microfinance and micro-insurance)
- **Access to information**, such as the collection and dissemination of data related to land-use practices and meteorological information
- **Research and development** in areas such as GHG accounting for different climate-smart agricultural practices; the development of baselines; and monitoring, reporting and verification protocols
- **Capacity building, education and training** in areas such as the negotiation of investment contracts and the integration of climate concerns into sectoral policies

These investments will help to promote agricultural and rural development today, while also creating the structures needed to facilitate smallholders' participation in carbon financing mechanisms in the future.

- **Maximize opportunities for promoting investment in the agriculture under the UNFCCC.** The newly launched negotiations on the development of an agriculture work program provide a key opportunity within the UNFCCC process for promoting actions that enable achievement of the triple dividend. Continued recognition of the links between agriculture and other mechanisms, such as REDD+, should also be built upon. Additional opportunities should also be pursued with respect to:
 - **NAMAs:** Continued negotiation of NAMAs provides opportunities for developed and developing countries to explore how this mechanism could also be used to target measures that provide smallholders with adaptation and food security benefits.
 - **GCF:** As progress continues to be made towards the operationalization of the GCF, recognition of the cross-cutting nature of agriculture will be critical. In particular, the creation of one or several cross-cutting funding windows should also be prioritized to ensure that agriculture activities that capture the triple dividend can be financed through the GCF beyond 2020.

The continuation of constructive discussions within the UNFCCC can help inform the types of financing mechanisms (both within and outside of the UNFCCC) that could help achieve the triple dividend.
- **Promote the establishment of national funds for climate-smart agricultural production.** Blending traditional agricultural finance and climate finance, new financing opportunities are needed specifically to help developing countries transition their agricultural sectors toward climate-smart agricultural activities, with a particular focus on meeting the needs of smallholders. Financed as appropriate by developing countries governments, international donor assistance and/or private sector financing, these funds could be used to finance initiatives that:

- Establish appropriate financing mechanisms that will help smallholders overcome the upfront costs associated with transitioning to climate-smart agricultural practices, such as payments for ecosystem services (where appropriate), preferential loans, microfinance (through new or established institutions), grants (to individuals or groups), tax incentives and rebates, and insurance (Streck et al., 2011)
- Promote the establishment of an enabling environment within developing countries
- Transfer appropriate technologies, such as the introduction of new agricultural practices that can deliver the triple dividend
- ***Flexible financing mechanisms are required.*** The types of interventions needed to enable smallholders to transition to activities conducive to achieving the triple dividend will be site-specific, making “uniform strategies and solutions ineffective” (Meridian, 2011, p. xi). Consequently, financing mechanisms need to be flexible enough that they can be adjusted to the needs of “specific agro-ecological, institutional and technological situations of different countries, including their different capacities” (FAO, 2010, p. 30). They should also be able to span public, private and carbon market options.

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