

Climate Change and Agriculture in Sub-Saharan Africa: New Concerns, Old Arguments?

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Summary

The purpose of this paper is to map current policy debates on climate change and agriculture in Africa. We analyse the key debates in view of key narratives and associated actor networks, and show how current discussions links to major debates within the agriculture sector over the past decades, helping to address the often missing attention to history in current debates on climate change and agriculture. Four dominant narratives on the role of agriculture in a changing climate in the literature are identified: (1) the Growth Narrative, (2) the End of Poverty Narrative, (3) the Sustainable Land Management Narrative, and (4) the New African Green Revolution Narrative. All of these can be traced back to discussions over several decades. We identify the distinct policy implications of each these narratives and situate contemporary policies alongside antecedent visions. Beyond examining the contrasts between them, our analysis also points to connections and overlaps through the identification of common understandings and assumptions by tracing back long standing debates on agricultural development over the past decades and identify particular ways of thinking in relation the causes and solutions that shaped agricultural policy in SSA. Our analysis suggests that policy differences are defined at the margins and to some extent 'toned down' by the uncontested acceptance and prevalence of Malthusian diagnosis of over-population and impending crisis and the dominance of impact-centred analysis of vulnerability. This translates into the convergence of policy positions around the idea that the core challenges of climate change adaptation and mitigation in agriculture is to produce: (i) more food, (ii) more efficiently and sustainably, (iii) under more uncertain production conditions, and (iv) with reductions in GHG emissions. While new elements have been brought in, the report finds that the narratives and counter-narratives represent a re-emergence and continuation of previous debates rather than any fundamentally new perspectives. The "supremacy" of expert knowledge, predominance of risk management approaches and the prevalence of neo-liberal thinking continue to dominate the political space within which climate change comes to be framed in relation to agricultural development policies.

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Preface

Climate Change and Agricultural Development policy processes in Sub-Saharan Africa

Climate change concerns are re-shaping the African agricultural policy debate, reflected in the increased number of conferences, research and development programmes for climate change adaptation and mitigation on the continent. Climate change has become a headline issue in policy statements from donors, governments and civil society actors. In the agricultural sector, most agencies have started re-thinking their agricultural portfolios in relation to the projected climate change impacts. New funding streams are providing new opportunities as well as challenges for the agricultural sector in Africa and elsewhere.

This study was commissioned by the Climate Change Theme of the Future Agricultures Consortium (FAC) to identify the main policy narratives on climate change within the agriculture sector. The review is carried out as part of an effort to better understand ongoing and emerging policy processes and their implications for agricultural development in Africa in a changing climate. Little has so far been done to try to unpack and understand what is becoming an increasingly complex and confusing landscape with a large number of actors and activities.

The particular context for the review is Sub-Saharan Africa (SSA), the focus of Future Agricultures Consortium. SSA is important as it is considered amongst the most vulnerable regions to climate change (Boko et al. 2007), has large potential opportunities for mitigation in the agricultural sector (UNFCCC 2008, FAO 2009b) and a region where natural resource based agriculture is essential to the livelihoods of the majority of the population (FAO 2009c)

1. Introduction

Agriculture is one of the most widely studied sectors with respect to the impacts of climate change as it is considered one of the most vulnerable sectors (IPCC 2007). Climate change and variability present new development challenges, particularly in Sub-Saharan African countries where the majority of the population depends on climate-sensitive activities, in particular, agricultural production (Thompson *et al.* 2010, IFPRI 2010, FAO 2010). Concerns about the additional challenges that climate change poses to agricultural development in order to meet poverty reduction and food security, have risen sharply in the international and national policy agenda in recent years. This has led to a proliferation of international institutions, research institutions and new funders devising agricultural policy solutions in a changing climate. Yet, little work has focused on understanding the implications of this emerging re-shaping of the agricultural agenda and the myriad of suggested policy responses. This paper aims to explore the various dimensions of the policy debate by unpacking the different narratives surrounding agricultural policies. In particular, it looks at the arguments made by various actors, and situates the contemporary discussions of agricultural development in a changing climate within the history of broader debates about food security and poverty reduction.

The paper builds on an assumption that the understanding of policy processes requires an examination of the complex interaction of the *narratives*

underpinning policies, the *actor networks* promoting or working against them, and *political interests* driving the process (Keeley and Scoones 2003). In *Section 2*, we introduce the analytical lenses through which we examine the ongoing and emerging narratives driving the policy process and outline the methodology of this report. Given the important role of agriculture as a source of livelihood and economic activity, we ask how the agricultural sector is responding to the challenges posed by climate change. By examining how different actors frame the policy debate concerning agriculture and climate change, we can better understand the assumptions, knowledge and interests framing the policy process.

To do so calls for a historical perspective that situates contemporary policies alongside antecedent visions. Such analysis allows us to explore the emergence within dominant narratives of particular ways of thinking about the causes of and solutions to agricultural development. In *Section 3*, we briefly trace long standing debates on agricultural development over the past decades and identify particular ways of thinking that have shaped the policy process. In SSA, concern over the critical role of climate in configuring livelihoods and national economies is not new. Africa's climate has been in constant change for centuries, with rainfall, rather than temperature, being the most relevant climatic limiting factor of food production (McCann, 1999; Warren, 2005) and with farmers having to continuously adapt to climatic variability (Mortimore). Seasonal changes have played a key role in shaping agricultural as well as pastoral

Table 1: Summary of Policy Narratives

Narrative	Framing of the problem	Policy Foci	Key actors
Growth	Agriculture is an engine for growth in SSA. Climate change provides key challenges but also opportunities to achieving growth and develop the agricultural sector	Food production; agricultural infrastructure, technology and access to markets; mitigation	IFPRI, IFAD, the World Bank, FAO, USAid, Regional and sub-regional African bodies
The end of poverty	Climate change presents a major threat to agricultural productivity and hence poses serious risks to ending poverty and achieving the MGDs	Protecting the 'poor' through risk management and social protection; Enhancing and adapting agricultural productivity through; Investing in technologies to inform crops and livelihood diversification,	Development donors, INGOs
Sustainable Land Management	Local agricultural practices are deteriorating the environment from which agriculture depends, and climate variability and change will exacerbate such processes. New techniques, technologies and practices are thus required to avoid further degradation and to effectively mitigate and adapt the changing climate.	Improve land management practices through better use of technology; rehabilitate soils, watersheds, grazing lands, forests; water efficiency; diversify production; organic, regenerative, or conservation agriculture; diversification of products and varieties	GEF, IFAD, CGIAR and UN agencies – in particular UNCCD, FAO,
Green revolution	Overcoming challenges posed by climate change related to agricultural production will depend on farmer's use of technology.	High-yielding packages; improved seed varieties; input intensification; improve farmers' access to markets; climate information technology	AGRA, IFAD, YARA, Melinda and Bill Gates Foundation, AfDB

practices in Africa, including temporary migration (Mortimore 2010, Naess *et al.* 2010).

Recent concerns about climate change have brought back the issue of African climate at the top of the political agenda (Ensor and Berger 2009) emphasizing the critical role the agricultural sector plays in both the mitigation of and adaptation to climate change. However, the take up of climate change as a key agricultural development concern to meet food security and poverty reduction goals and its integration into pro-poor planning is a fairly recent area of policy and research. Hence, making sense of climate change policy within the agricultural sector also requires a closer exploration of some of the key events, where major shifts in the international policy process have occurred.

In *Section 4* we look across the timelines of the policy process in the development and climate change agendas. This allows for the identification of key moments, when major shifts in the policy narratives occurred and how, as a result, the climate change debate intersects with the agricultural narratives. Given this background, in *Section 5* the paper then looks at the key players shaping the agricultural policy debate and draws on the agricultural and climate change policy statements and initiatives, to analyse the recently emerging policy narratives surrounding agriculture and climate change. Four policy narratives are identified, each with different underlying assumptions and implications for policy and practice. Contemporary agriculture development policy is constructed around a series of interweaving narratives about food security and poverty reduction, environmental crisis, economic growth and technology and innovation.

Based on these findings, in *Section 6* we present our analysis and discuss, in particular, the prevailing assumptions that continue to dominate debates surrounding agricultural development, and thereby providing a “reality check” on the status of the policy debate. An in-depth analysis of the relative power of each of the actors and its impact into policy process is, however, beyond the scope of this paper. In *Section 7* we conclude with critical reflections on the challenges for agricultural policy. We caution against the revival of a recycled agenda and orthodox thinking that have for long time proven to fail.

2. Building a framework for Analysis

2.1. Framework for Analysis

Before exploring the nature of the ongoing and emerging agriculture development policies in relation to climate change it is necessary to introduce the analytical lenses through which our analysis takes place. In SSA policy responses to agriculture in the context of climate change have mushroomed in recent years, but how can we understand the myriad of policies put forward by the wide –and increasing – range of actors? Understanding the policy processes requires an approach that can help to identify both what and how particular policies of climate change and agriculture are taken up and to locate

the emergence and shaping of these versions in a historical context.

We first consider climate change and agricultural policy in relation to the study of policy processes – lenses which help explain the diverse set of actors and the narratives framing debate. We look at the importance of framings, which emphasise how policies take shape around the construction of the ideas of a ‘problem’. In particular, we look at the role of scientific knowledge and notions of risk and uncertainty as keywords in the framing processes. As we will see, these dimensions help us understand how climate change and agricultural policies have unfolded.

Understanding the nature of policy process – Narratives, Actor-Networks and Knowledge in a context of risk and uncertainty.

This paper differs from the traditional view of policy-making as linear processes of rational decision-making, in which research results (scientific evidence) inform policy makers who then make a rational decision based on an objective weighing of different arguments (Keeley and Scoones 2003). It has become evident that, such a linear view, fails to capture the more complex and contested realities of policy-making in practice (Leach and Fairhead 2003). An alternative understanding of policy processes examines the interaction of **narratives** underpinning the policy, **actors** promoting or resisting it and **political interests** driving the process (KNOTS 2006). In other words, policy results from the interplay of actors, institutions, political and power dynamics and conceptual “framings” that structure and determine what is considered (ir)relevant, (un)important and (im)practical.

An analysis of policy processes of agricultural development in the context of climate change thus requires an understanding of how particular ways of thinking about agriculture and climate change have gained ascendancy, and how they come to determine the frame through which policies are defined. An examination of the narratives draws attention to the ways in which particular concepts or story lines ‘frame’ what and who is taken into consideration in (and excluded from) the policy process. The term narrative is used here to highlight the constructed nature of these framings of particular problems and their proposed solutions, and the attachment of those narratives to certain actors, for example, particular policy narratives or the narratives of particular social groups (Thompson and Scoones 2009). In other words, narratives not only convey story lines of cause and effect – they often have embedded the advocacy of particular policy instruments. These narratives establish frames of reference that define and bound what forms of knowledge count, and whose versions, interest are legitimate (Hajer 1995). From this perspective, narratives of the causes of and solutions to climate change both produce and drive policy processes.

There seems to be a wide agreement on the critical role of the agriculture sector in Africa. However as will be seen in *Section 5*, in the context of the changing climate, the *narratives* that frame the debate about the current and future policies and investments required vary

among agencies. Climate change funding is increasing, with a number of funds becoming operational on both mitigation and adaptation, providing both opportunities as well as challenges to farmers (Naess and Tanner 2010). This includes climate change adaptation and mitigation mechanisms linked to agriculture such as the NAPAs, REDD+ or the CDM. Despite new efforts on integrating climate change, agriculture and food security how development strategies such as agriculture should be integrated within climate change adaptation has remained a contentious issue within climate change negotiations. While some actors seek to keep climate change initiatives simple with no additional requirements (Holloway and Giandomenico 2009), others argue for a 'development-first approach' in which a climate change regime should focus on development strategies and the capacities of developing countries to implement climate benefits (Davidson *et al.* 2003). The way climate change is framed clearly has an important influence on the ways in which agricultural policies come to be shaped.

Actor-Network

Traditional models of policy analysis also tend to obscure the extent to which policy is shaped through interactions between *actor-networks* at multiple levels (Keeley and Scoones 1999, 2003). Framing a problem such as climate change can incorporate a wide range of issues or can be highly restrictive whereby issues are narrowly defined and addressed separately (Hjerpe and Linner 2009). Policy processes surrounding new agricultural development today involve a wide and growing range of actors, including scientists, research institutes, government bodies, international and organizations and local farmers' organizations among others. The variety of assumptions, values, interests and knowledge of different organizations (actors) provide the basis for many diverse ways of framing agricultural policies. Hence, an examination of policy narratives puts the actors involved in the framing of climate change and agricultural policies at centre stage of the analysis. This in turn, helps to highlight the importance of taking account of the networks through which certain versions of climate change and agricultural policy processes come to dominate the policy space.

As will be seen, official narratives tend to focus on certain aspects of climate change and economic and technological aspects frequently dominate the debate; yet only a few major global players largely frame the debate and related policy approaches. As we explore in this paper, this gives rise to a set of dominant approaches that emphasize universalized notions more than local and contextual ones, and technical issues more than social ones. Nonetheless, these narratives are also being contested and critiqued by other players. Starting with a focus on the historical analysis of main narratives and moving to an examination of current policies allows us to see which policies persist or emerge. This will be further explored in section 6. It is important to remind ourselves that policies are inevitably political and contested, driven by a set of actors with different interest and relative power. Power and politics are an important component of policy-making, which not only shapes each stage of the policy process (i.e from agenda setting to resolution)

but also what narratives become dominant (KNOTS 2006). As such, we acknowledge that agricultural policies, in the context of climate change, are also inevitably shaped by the relative power of the actors involved and their political interests. This paper presents a literature review of the current state of the art of agricultural development policies, identifies dominant narratives framing and shaping the debate and main actors involved. Nevertheless, an in-depth analysis of the relative power of each of the actors and its impacts into policy process is beyond the scope of this paper.

The role of science and scientific knowledge

In agriculture policy science plays an important role in revealing and explaining environmental and agricultural problems, their causes, and providing the evidence to their solutions (Berkhout *et al.* 2003). Traditional views of policy analysis tend to assume that scientists establish the facts about climate change realities, and policy-makers come up with policy options in the light of such facts. However, in reality, the relationship between scientific research and policymaking is not so straightforward. There is a growing body of literature examining the blurred boundaries between science and policy, as well as how scientific knowledge serves to legitimize policy positions and establish power (Pettenger 2007, Leach and Fairhead 2003). For the purpose of this research two critical points emerge. First, the implicit understanding that scientific and technical information leads to better policy results in "non-expert" or "non-scientific knowledge" being excluded from the policy process. Second, even if scientific data tends to be presented as "neutral", different actors frame this information differently – favoring specific data or statistics to support their policy positions (Leach and Mearns 1996).

Within the context of climate change, agricultural policy relies on expertise that defines climate change and the challenges it poses for the agricultural sector. In the processes of the production of agricultural policy, climate change models play an important part. However, scientific models are inherently subjective, as scientists frames both the problem and determines the parameters of analysis (Swart *et al.* 2004, Hjerpe and Linner 2009). Put in another way, climate modelling relies on constant value statements and the perspectives and values inherently embedded in international scientific and policy debates shape national science and policy processes (Keeley and Scoones 2003, Fairhead and Leach 2003). This research looks beyond specific scientific debates to the more general, but equally important, underlying question of how science is framed and the way it frames policy process. As will be seen, major differences in the framing of scientific facts by different actors become apparent where science is politicized, as technical arguments and interpretations incorporate – even if implicitly – the social and institutional interests and values of their proponents.

Risk and Uncertainty

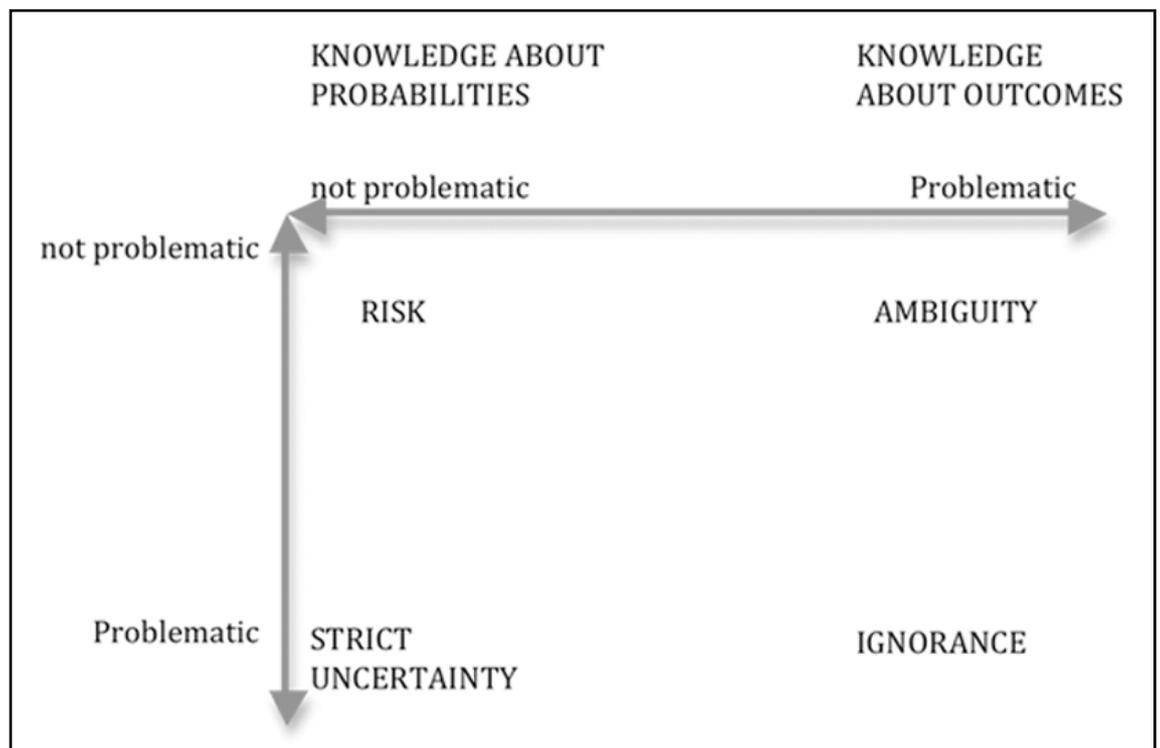
Policy-making in agriculture and climate change is set against a context of decision making under uncertainty. Notwithstanding the progress made in recent years in climate projections, these trends and the impact on society, the environment, businesses and the economy remain uncertain over large parts of Africa. In particular, there is high uncertainty amongst climate models about the direction of change in seasonal rainfall over large parts of Africa (Wilby and Dessai 2010, Boko et al. 2007). Several modeling studies have also assessed the potential impacts of climate change on agricultural production in SSA (Van Vuren et al. 2009, Challinor et al. 2009, IPCC 2007), although the projected ranges of shifts in yields for the major crops vary widely. Yet the urgency of food security and poverty goals, combined with what we do know about future population trends means that important decisions about agricultural development (Vogel 2005) will have to be made, and will have important implications for the ability of agricultural systems to adapt to future climate change

In Africa, concern over the climate's critical role in shaping local livelihoods and national economies in Africa is not new (Vogel 2005). Climate variability and recurrent disasters have always played a significant role in daily life and development in SSA. However, climate change poses new challenges to the agricultural sector. In addition, it will also be difficult to detect a clear climate-change effect within the next couple of decades, even with an underlying trend (Wilby, 2006). The large uncertainty surrounding both the magnitude and timing of slow-onset or extreme climate-related events means that consideration of risk and uncertainty during the formulation process is inescapable. This uncertainty contributes to considerable scope for differences of opinion as to the appropriate policy response. In other

words, policymakers have to make decisions in the face of, not only calculable risks (where the range of possible outcomes and probabilities are known), but uncertainty (where the possible outcomes are known but there is no basis for assigning probabilities and in such cases judgment often prevails), ambiguity (where there is disagreement over the nature of the outcomes) and even ignorance (where 'we don't know what we don't know' and the possibility of surprise is ever-present) (Scoones et al. 2007)

The main point to be highlighted here is that in a context characterized by high levels of uncertainty or even ignorance, there are no clear and neat answers to be found through "scientific" evidence. Adaptation to climate change is not as simple as designing projects, drawing up lists of possible measures and implementing these (Schipper 2007). Choices for responding to the changes, therefore, will require trade-offs and difficult decisions (O'Brien 2009, Eakin et al. 2009). Amidst this uncertainty, approaches for quantifying climate risk are an emerging area of research and practice (add ref). Critical for this research is that the distinction of uncertainty from risk carries with it a set of implications for the politics of and policies for dealing with climate change. For example, the concept of risk implies that 'we know outcomes and probabilities' and therefore we can measure and control potential threats. Consequently, calculations of risk often seek to control outcomes through monitoring and predicting risks, and to adopt command/control policy solutions through, for example, early warning systems to deliver rapid response and disaster relief when a disaster strikes. On the other hand, dealing with uncertainty require, for example, flexible decision-making processes, adaptive management and learning by doing approaches. Paying attention to how

Figure 1.



Source: Scoones et al. 2007

policies frame climate risk and uncertainty can thus provide us with insightful views on the assumptions underlying policies in agricultural development.

Since the emergence of climate change at the top of the political agenda, a growing number of research and guidance tools and methods are available for policymakers under climatic uncertainty, including principles and steps for robust decision making under uncertainty (Mackellar *et al.* 2010, Dessai and Wilby 2010), principles for avoiding maladaptation (Barnett and O'Neil 2010), and characteristics of sustainable adaptation (Eriksen *et al.* 2011). The guidance tools and methods range from adjustments in existing practices to more fundamental changes in development practices. The former present a traditional linear view of the policy-making process, while the latter challenges equilibrium, predictability and linear thinking and management practices while also proposing diversity, dynamism and uncertainty to be embraced at the core of policy-making.

This paper examines how notions of risk and uncertainty are framed in order to understand policies being put forward and how this account for climate changes uncertainties. Different framings will vary in how far they acknowledge and address the many uncertainties involved and particular framings in turn, justify particular approaches to agricultural policies in a changing climate. This paper reviews narratives on agriculture and climate change in this light, posing questions such as how narratives differ in their treatment of uncertainty, and scientific data, how goals of food security and poverty reduction are formulated, and how different groups of actors and their knowledge are considered.

2.2. Methodology

The primary data used in this study was gathered through content analysis of institutional guidelines, policy documents or statements, conferences and country reports. This desk-based study commenced with a web search aimed at identifying the key issues and players in the field. This led to the compilation of a database (See Annex I), which identified and described broad set of institutions working on agricultural development and climate change in Africa. While the database may not provide an exhaustive list of the key players or their activities in this rapidly expanding arena, it provides a useful overview.

Official policy documents were screened through a set of questions:

- What is the 'policy narrative'?
- What type of data is used to frame the arguments?
- Who is involved and how they are connected?

Policy documents, reports or articles were searched online for the period of 1997 to 2010. This period was selected as it covered a number of important climate change related events, from the formulation of the Kyoto Protocol to the publishing of the latest Intergovernmental Panel on Climate Change (IPCC) assessments. The set of policy documents and reports to be analyzed was put

together with the results of searches. The keywords used were climate change, climate change adaptation and mitigation and agriculture. Given that search results included many articles where climate change was merely referred to in passing, the initial database was narrowed down to those reports where it was the core (or associated with the core) theme. This required a scan-type reading of all the texts to select those where climate change was referred as the significant part of the policy/report; climate change was presented as the cause of the central theme; or "solutions" for it were discussed.

Drawing on the agricultural and climate change policy literature and websites, a framework was then drawn up of some of the main actors shaping the agricultural agenda in Africa. These are mainly multilateral institutions such as the United Nations family and international financial and Bretton Woods institutions, but also regional bodies, national governments, bilateral development agencies of Organization for Economic Co-operation and Development (OECD) governments such as the UK Department for International Development (DFID) and the United States Agency for International Development (USAID), private foundations, agricultural research institutions as well as relevant African institutions. Following from online search of documents and the content analysis and the compilation of the database, the actors framing the current debate concerning agricultural development and climate change agenda were clustered according to common narratives. The focus of this report is limited to policy priorities, not implementation or impacts or the political dynamics involved in the process.

3. Key themes in agricultural policy and climate in Africa: 1950s – 1990s

There is an increasing focus on what should be done in order to mitigate emissions from and adapt to the effects of climate change in the agricultural sector, but little attention has so far been given to the interface with long standing debates on agricultural development. This section briefly traces the debates surrounding agricultural development in Africa over the past decades, introducing the key models and theories that have shaped climate change and agriculture policies in sub-Saharan Africa. Any attempt to identify evolving ideas in agricultural development over the past half-century risks oversimplification. We are mindful of this complexity. We draw on a large body of work that has examined dominant narratives in the agricultural sector in the 20th century (references). From that we seek to identify dominant and alternative themes that have had major impacts on agricultural development practice since the 1950s, and which in turn – as we will show later – has major implications for current debates.

3.1. Dominant narratives, framings and assumptions

The modernization project – transforming the agricultural sector

The challenge of food security in SSA is not a recent concern – it has long been a key driver of policy the policy process in the region. During the 1950s and 1960s, the modernization of the agricultural sector in Africa became a common objective in development plans, influenced strongly by Malthusian concerns about increasing food production to meet growing populations. The need for “modernizing” the sector was framed as a problem of “rural backwardness” in the region as modernization was equated with industrialization and urban development (Thompson and Scoones 2009).

Agricultural scientists and technologists – supported by mainstream institutions such as the World Bank and CGIAR (Consultative Group for International Agricultural Research) – has dominated agricultural development policy debates since the 1960s in Africa (Scoones *et al.* 2005b). They advocated input-focused intervention strategies, addressing farm-level supply-side constraints to boost agricultural productivity, largely based on farm-level production function models. The narrative associated with this argued that growing populations coupled with declining per capita food production – due to lack of modern technologies - will result in major food gaps. The argument then proposed modernization and transformation of existing farming systems to be a policy priority.

Agricultural development policies in this sense happened in two phases. Firstly, large-scale projects and *mechanisation* were emphasised in the 1950s and 1960s when colonial governments focused on commercial agriculture. Production was directed towards export commodity production following colonial patterns (Abdu and Marshall, 1990). The emphasis was on mechanisation, output intensification and improved irrigation systems and large-scale agricultural projects became common (Richards 1985). For instance, in Malawi agricultural export strategy featuring tobacco, sugar and tea was produced largely on agricultural estates rather than on peasant holdings (Paarlberg and Grindle, 1991). In Nigeria irrigation projects and dam buildings altered the traditional land tenure system leading to the resettlement of a large number of farmers and their families (Kolawole *et al.* 1996).

During the 1970s agricultural modernisation focused on *technology transfers* and input intensification for small farmers following the Asian Green Revolution (See Box 1).

Key in the development of a green revolution was the understanding of peasant livelihood systems. Farming Systems Research (FSR) was the major school of thought in achieving this and involved the employment of social scientists informing natural scientists about the constraints and opportunities experienced by farmers

Box 1: The 1970s: a Green Revolution for sub-Saharan Africa

During the 1970s, the focus on agricultural modernisation shifted towards the small farm level (Richards, 1985:37-38). Large scale agriculture was not meeting its expected objectives as agricultural GDP growth had remained stagnant across the region. Since the bulk of agricultural exports and food supplies still derived from the peasant sector it was agreed that much more attention should be paid to the rural sector. Although partly instrumental, this new focus was also consequence of a greater emphasis on distributional equity, employment generation and poverty reduction. The 1970s was hence a decade of basic needs and integrated rural development projects or what Schech and Haggis (2000) call ‘modernisation with a human face’.

The Food and Agriculture Organization (FAO) of the United Nations convened a major symposium on ‘Agricultural Institutions for Integrated Rural Development’ in 1971. In addition, in 1973 World Bank’s president Robert Mc Namara, pledged his organisation to direct its resources towards increased productivity and welfare of the rural poor in developing countries (Mc Namara, 1973). The next year during the World Food Conference it was agreed that in order to reduce food insecurity governments should remove the barriers to agricultural production and those faced by agricultural producers. Part of the strategy was ‘the involvement of small farmers, fishermen and landless workers in attaining the required food production through increased agricultural inputs, credits and technology’ (UN, 1975).

In this context and influenced by the ‘success’ of the Asian green revolution key development actors came to agree that the technology-led Asian and Mexican green revolution should be replicated in sub-Saharan Africa. Where was this need stemming from? Firstly, part of the argument was influenced by carrying capacity figures and the idea that African states’ food production was generally unable to keep pace with population growth and demand (CGIAR in Richards, 1985:138; Hrabovsky in Toulmin, 1988) and soil degradation (Woodehouse, 1989). Secondly, the Green Revolution emerged at a time when donors and some developing country governments tended to define agricultural reform as production-oriented and in sector specific terms. Yield per unit of land area was used as the criterion of improvement that could contribute to poverty reduction.

As the binding constraints on agricultural production were said to be largely related to technology, infrastructure and investment in the sector (Paarlberg and Grindle, 1991) modernisation was seen as the key to increase food production and reduce poverty (Hrabovsky in Toulmin, 1988; Chambers 1979). The underlying assumption was that if small farmers were provided with enough inputs and technology, the key barriers to agricultural productivity in this context of ‘primitive and stagnant indigenous agriculture’ (Buddenhagen in Richards, 1985:138) would be overcome (Toulmin, 1989; Scoones *et al.*, 2005; Warren, 2005).

For instance, in the 1974 World Food Conference it had been agreed that ‘all countries, and primarily high industrialised countries’ should promote the advancement of food production technology and should make all efforts to promote the transfer, adaptation and dissemination of appropriate food production technology, for the benefit of the developing countries’ (UN, 1975). This led to the proliferation of numerous projects on technology transfer of as a means of improving resource poor farmers’ livelihoods. As in the Asian Green Revolution, small-farmer projects in Africa during the 1970s provided a biological package of fertiliser and improved high-yielding seed varieties (HYVs) (Richards, 1985:38).

(Toulmin, 1988:188). A crucial attribute of the modernisation project was that both increased production and equity goals appear to be satisfied simultaneously via the emphasis on small-farm agriculture. FSR was described as 'an innovative approach to identifying and meeting the needs of small farmers and their families for agricultural equipment that were not available to them' (Ellman, 1987) as, in theory, it involved an analysis of farmers' situation through a holistic and participatory approach (Biggs, 1985:2). However, in practice, FSR resulted in the set up of large, expensive, well-equipped research organisations staffed mostly by expatriate scientists who largely ignored farmers' needs and constraints (Toulmin, 1989).

Agriculture, Environmental Degradation & Rehabilitation

A second equally important narrative proclaimed a crisis of environmental degradation. Alongside the policy debate around food security and agricultural production, there was a recurrent concern about the natural resource base upon which agriculture depends. The dominant narrative around modernization and productivity coupled with the devastating droughts and famines across SSA during the 1960s and 1980s, led to increasing concerns around the links between agriculture, climate and productivity levels. Concerns led to a very active debate in research and policy on the causes and dynamics of environmental and climate change. In particular,

climatic and environmental factors were studied in relation to land use by Sahelian societies. Again, Malthusian theories were highly influential where growing populations coupled with resource depletion, led to widespread deforestation, soil erosion and soil fertility decline. With environmental degradation, the argument continued, agricultural production would decline, food insecurity increase leading to increase levels of poverty and hunger.

During the 1970s and 1980s different studies suggested that human activity was a major driver of environmental and climate change in the Sahel (Ibrahim in Swift, 1996:78-79) which led to a particular interest in the links between soil degradation and human activity (Scoones et al. 1996, Olsson et al. 2005). Discussion intensified again after severe droughts in the 1980s (Kowal and Kassam in Mortimore and Adams, 2001:50) and desertification continued to be a key concern in the agenda with new anti-desertification policies emerging in the 1990s. In 1992, the UN General Assembly resolved to establish the Intergovernmental Negotiating Committee for the Elaboration of an International Convention to Combat Desertification (INCD). The same year the United Nations Conference on Environment and Development (UNCED) included desertification as part of the agenda (Bauer and Stringer, 2008) and in 1994 the United Nations Convention to Combat Desertification (UNCCD) (especially in those countries affected by drought and desertification, particularly in Africa) was signed. Global strategies such as the UNCCD, national

Box 2: Famines and the Environment

In line with the rangeland management model, famines were explained as a consequence of food insecurity and food availability decline (FAD). As the previous focus on production in the agricultural modernisation project, famine studies were based on the premise that any factor that disrupts food production (i.e.: drought, flood or war) can cause famine. If these cause a crop failure leading to FAD that goes below the subsistence needs in a large share of the population, it is possible to speak about a famine (Sen, 1981; Devereux, 1988). The focus on production to explain famines suited well with degradational pathways theory. The argument was that farmers and herders had exceeded ecosystems carrying capacities. As a result, the land was not fertile anymore leading to a food availability decline. This idea guided the emergence of soil and water conservation (SWC) measures after the 1970s Ethiopian famine. Starvation was framed as due to a decline in food production consequence of human-induced soil degradation and excessive land pressure (Bewket 2007).

Influence of the FAD approach in global policy-making in Africa was visible from 1974 until 1980 when the focus was on food production. At the 1974 World Food Conference it was agreed that the focus should be on 3 main solutions, including: to increase food production, especially in the developing countries; to improve consumption and distribution of food and to build a system of food security (UN, 1975). This suggests that the focus was less on the causes of food insecurity and the dynamics of the rural world and more on the production and provision of food. The Declaration had also a focus on the global level as it was recognised the interrelation between the world food problem and the international trade, in particular issues related to food prices (UN, 1975).

During this period famine prevention became a critical issue. Policies focused on agricultural production and food supply rather than on access to food and they were characterised by a lack of regard for long-term improvements. As a result of this short-term vision, emergency food aid increased sharply in sub-Saharan Africa during the 1980s. It went from a low proportion of 14% of total cereals food aid in 1979/80 to a high of 51% in 1984/85 (Dearden and Ackroyd, 1989). As within the modernisation project, science and technology also played an important role here with the proliferation of early warning systems (EWSs) managed by national governments, relevant UN agencies and a number of bilateral donors and non-governmental organisations (Food Security Unit, 1992). At the beginning of the 1990s most countries in the Sahel and Horn of Africa had some kind of early warning system. Most of them were short term-oriented rather than long-term-oriented and had a strong focus on production, hence providing information on food supply, crop prospects and weather. Thus, responses to EWSs tended to focus on food aid provision rather than on a sustainable improvement in access to food (Buchanan-Smith et al., 1991).

The 1992 World Declaration on Nutrition showed a different approach and recognised the relationship between access to food and nutritional wellbeing and stated that 'there is enough food for all and that inequitable access is the problem'. The role of agriculture in the achievement of food security and the conservation of natural resources was highlighted and the declaration warned that dependency on food aid should be avoided.

environmental action plans and project documents were replete with statements to combat soil erosion and dramatic figures of soil loss (FAO in Scoones *et al.*, 1996:3).

Despite uncertainty, the focus at the UNCCD and the UNCED was on “managing fragile ecosystems: combating desertification and drought” and science played a minor role in policy-making with scientists having limited opportunities to consider or question the salience and legitimacy of the knowledge being used, such as the definition of desertification (Bauer and Stringer, 2008). Carrying capacity and rangeland management models explained environmental degradation as a human-induced “crisis”, particularly due to over-cultivation, overgrazing and overstocking. Studies carried out in the 1970s by USAID, the Sudanese government, UNESCO and UNEP framed the desertification problematic as being the result of human populations increasing at a higher rate than the capacity of the land to support them as well as inappropriate forms of land use (Swift, 1996). In addition, a World Bank-led research suggested that ‘interactions between droughts and human abuse of the environment are the primary cause of the current crisis in the Sahel’ (Gorse and Steeds, 1987). Concerns led to the launch of global initiatives to improve understanding of desertification and its impacts as well as to stimulate development and mitigate its effects (Bauer and Stringer, 2008). The United Nations Environmental Programme (UNEP) convened the 1977 United Nations Conference on Desertification (UNCOD). As a result, a Plan of Action to Combat Desertification (PCAD) was launched with a view to controlling desertification by the year 2000 (Bauer and Stringer 2008). Despite uncertainty and lack of clarity of the data used, estimates by UNEP formed the basis for major international investments in environmental protection in Africa during the 1980s and, as a result, ‘anti-desertification’ projects became common in Africa with different measures promoted, mainly related to soil and water conservation (SWC) (Scoones *et al.*, 1996).

As with the modernization project and the ‘Green Revolution narrative’, Environmental rehabilitation narrative was strongly derived from a Malthusian diagnosis of over-population and impending crisis. The continued threat of famines coupled with scientific data establishing the links between environment, human activity and food production has placed the environmental crisis narrative at the centre of the political agenda since the mid-1980s.

Agriculture as a catalyst for economic growth - Structural adjustment policies

For much of the 1980s and 1990s, a uniform view dominated donor thinking surrounding the role of agriculture in Africa. Following the modernization thinking, the emphasis at this stage was economic growth, and the critical role agricultural development played to this end. Promoted aggressively by the international financial institutions, the Washington Consensus policies focused on ‘getting the state out’ and ‘getting prices right’. These ideas translated into policies of market liberalization, including parastatal abolition or commercialization, and removal of input subsidies. With few exceptions, agricultural reforms based on

‘market fix’ thinking were implemented across Africa (Scoones *et al.* 2005a). As a result, the 1980s and 1990s were characterized by underinvestment in the agricultural sector and the share of Official Development Assistance (ODA) to agriculture dropped significantly, falling from a peak of 17 percent in 1979 to 3.5 percent in 2004. It also declined in absolute terms: from USD 8 billion in 1984 to USD 3.5 billion in 2005 (Conway *et al.* 2010). Paradoxically food production increased in Africa by over a quarter during the 1980s and 1990s (Devereux and Maxwell, 2001) while evidence suggests that in Africa around 32% of the population is undernourished (Conway *et al.* 2010). This oxymoron has been explained by arguing that the post-structural adjustment reform era was characterized by the emergence of a two-track agricultural sector: one profiting from new commercial opportunities, the other characterized by stagnation and poverty (Chema *et al.* 2003 in Scoones *et al.* 2005).

3.2. Counter-narratives: the role of small farmers and dynamic systems

Agricultural research and practice for resource-poor farmers

Parallel to the dominant narratives presented above, alternative views emerged around farmer-focused research which advocated putting the ‘last first’ in development practice and agro-ecosystem analysis (Chambers 1983). Since the 1970s the alleged benefits of the modernisation project started to be questioned as different studies provided evidence on the systematic neglect of poor farmers’ constraints within agricultural policies (Lele, 1975; Chambers, 1978). A growing body of literature provided evidence of the inadequacy of prevailing agricultural models and policies to adapt to the environmental, socioeconomic and cultural characteristics of sub-Saharan Africa. Traditional knowledge as well as farmers’ role in agricultural sustainability and innovation were emphasised (Richards, 1985). This people-oriented development view had as its starting point the rural realities of poor people and urged for agricultural research and policy to address the perceptions and priorities of families of resource-poor farmers rather than those of scientists (Chambers 1989). The narrative highlighted that agricultural policies were dominated by top-down approaches to policy making by international donor organisations where policies were guided by experts’ assumptions on farmers’ needs. In addition, research programmes tended to engage in determining not farmers’ ‘constraints to production’, but ‘constraints to adoption’ of a narrow range of technological alternatives determined by the ‘mandate’ (i.e.: crop type) of the institution running the programme (Woodehouse, 1989). As a result, not only were poor farmers’ constraints being largely ignored, but also their traditional agricultural practices (Beck, 1995:161; Toulmin, 1988:193).

The counter-narrative thus argued that a mere focus on aggregate food production would fail to overcome rural poverty since it is much more important *who* produces food and *who* can obtain it (Chambers and Ghildyal, 1984). A pro-poor approach to technology was

Box 3: Farmers' knowledge and indigenous agricultural innovation

In response to the previous neglect for traditional agricultural practices, social scientists produced a wide body of literature analysing the role of indigenous knowledge in environmental sustainability and technical innovation during the 1990s (Richards, 1985; Mortimore, 1992; Leach and Mearns, 1996; Fairhead and Leach, 1997; Reij et al., 1996). For instance, studies carried out in West Africa highlighted villagers were well acquainted with crop varieties and that farmers already conducted input-output on farm trials to try crop varieties (Richards, 1985).

The 'farmers first and last' approach to research extension and development was challenged during this period. Newtonian assumptions on the cause-effect relationship between participatory approaches to on-farm research and a better understanding between natural sciences and rural people's knowledge were questioned. Instead, it was suggested that participation is not a linear process that automatically leads to the inclusion of resource-poor farmers. It is very likely that new techniques such as the PRA do not lead to a better inclusion of resource poor farmers, mainly because those who participate are those whose beliefs are more similar to those of modern sciences (Thompson and Scoones, 1992).

Advances in indigenous technical knowledge studies had suggested that far from being static, farming systems are constantly changing, especially in Sub-Saharan Africa where farmers are constantly adapting to climatic variability. Unlike the conditions of modern science experimentation which are generally controlled, farmers innovations systems happen in highly variable contexts driven by shocks, physical and biological factors (Maxwell 1986). From this perspective, going beyond the FFL approach would imply allowing the research and extension process to be flexible, change and evolve when it is in the hands of farmers (Thompson and Scoones, 1992).

hence needed, implying a shift from the transfer of technology (TOT) approach to a 'Farmer First and Last' (FFL) approach. While the former referred to an 'upstream' meaning of FSR which favoured large-scale farmers, the latter referred to 'downstream' farming systems research which starts and ends with resource-poor farmers (Chambers and Jiggins 1987, Chambers and Ghildyal 1984). This shift implied that local communities' knowledge and efforts to increase environmental sustainability should not be dismissed and both modern science and traditional knowledge needed to be applied to resource management issues (Chambers, 1979). At this time a considerable number of articles recognised the depth of farmers' indigenous knowledge and their readiness to experiment with new crops and production techniques such as inter-cropping in East-Africa (Howes 1979, Belshaw 1979, Ellman 1987).

Since the 1990s participatory techniques to agricultural research and development such as Participatory Rural Appraisal (PRA) spread across sub-Saharan Africa and PRA was practised by many NGOs (Chambers, 1992). In recent years, arguments for participatory approaches to agricultural development have become increasingly influential (Keeley and Scoones 2003).

Sub-Saharan African ecosystems at disequilibrium

As with the modernization approach, challenges also increasingly emerged for the environmental degradation narratives and its linkages to human induced environmental crisis. The failure of the replication of the green revolution in Africa had evidenced not only the ignorance of socioeconomic and cultural factors, but also the lack of knowledge of sub-Saharan African ecosystems. Policy assumptions were largely driven by the rangeland management model where ecosystems tended to be in equilibrium and excessive human activity would lead to environmental degradation. However, in the late 1980s the rangeland model was challenged after several case studies provided evidence of the extreme intra-annual as well as inter-annual climate variability in many parts of sub-Saharan Africa (McCann 1999). A new model emerged, the state-and-transition model suggesting that

the nature of ecosystems in many parts of Sub-Saharan Africa did not coincide with the equilibrium model. Thus, far from being static, climate in the African drylands is dynamic, unpredictable and disequilibrium (Warren, 2005:662). The recognition of this disequilibrium nature implies that, unlike in the range model, the problem of soil degradation is mostly due not to human activity but to extreme changes in climatic conditions. From this perspective, small farmers and herders were not the major cause of environmental degradation as the rangeland management model suggested. Rather, the fragility of sub-Saharan African ecosystems was the main factor negatively affecting soil degradation and subsequently farmers and herders, whose subsistence depended on natural resources (Smith, 1990).

Environmental social scientists also produced a vast amount of research work on desertification, many of them rejecting the idea of an ecological equilibrium that can be imbalanced by demographic and economic forces. The drought, stocking, degradation and the food crises were addressed by the argument that if these processes are so damaging, why are small African farmers and herders 'still in business'? (Mortimore and Adams, 2001). It was argued that the existence of the crisis narrative had political implications and was used by donors and development experts as a means to justify ownership of land (Roe in Scoones *et al.*, 1996). While soil erosion was a real problem in many parts of the continent, the prevalence was not as high as suggested by development experts.

In line with the state-and-transition model, social scientists gained evidence of African farmers and herders' efforts to maintain soil fertility in disequilibrium ecosystems (Scoones *et al.*, 1996). As a result, anti-desertification and ecosystem management policies were criticised for undermining small farmers' efforts to achieve sustainable land management practices (Leach and Mearns 1996, Fairhead and Leach 1997, Behnke and Scoones 1993, Swift 1996). Natural scientists were criticised for judging opportunistic strategies such as herder movements or migration as due to desertification. It was also argued that carrying capacity figures which condemned indigenous practices as being environmentally damaging

undermined the strengths of indigenous land systems (Leeuw and Tothill 1990).

4. A timeline of recent policy processes on agriculture and climate change

4.1. The re-emergence of agriculture

From the 1980s onwards, agriculture became increasingly ignored in many developing countries. This happened both in development cooperation policies – where the share for agriculture dropped from 18 per cent in 1980 to 4 per cent in 2007 – and in national budgets. The share of Official Development Assistance (ODA) to agriculture dropped significantly, falling from a peak of 17 percent in 1979, the height of the Green Revolution, to a low of 3.5 percent in 2004. It also declined in absolute terms: from USD 8 billion in 1984 to USD 3.5 billion in 2005 (World Bank 2008). While public investment in agriculture, particularly in smallholder agriculture and food security, from international donors and national governments declined sharply during the 1980s and 1990s, this period also witnessed strong growth in private sector agribusiness and the food industry, with structural shifts in research to private crop breeding and agrichemical development (Janvry and Sadoulet 2010).

Despite this apparent lack of interest and investment in agriculture and rural development, agriculture-led growth has recently returned to the top of key international development agendas (Thompson and Scoones 2009). After two decades of decline, investments in agriculture are now on the rise. Global, regional and sub-regional initiatives have generated a multiplicity of commitments to addressing poverty and hunger with a new focus on agriculture. This comes from numerous sources – whether from international initiatives such as the UN Millennium Project's Task Force on Hunger (2005) or the Commission for Africa report (2005); from within Africa, such as the African Union and NEPAD's (New Partnership for Africa's Development) Comprehensive Africa Agriculture Development Programme (CAADP) (NEPAD 2003), from national governments themselves or from the international donor community (SIDA 2009, DFID 2009, World Bank 2008).

A combination of events during the period of 2005–2008 placed agriculture for development in the headlines (Janvry and Sadoulet 2010). Significant events include: the sharply rising food prices; an approaching 2015 deadline for the MDGs that 'will not be met without greater attention to agriculture' (Janvry and Sadoulet 2010:14); rising rural-urban and regional disparities creating political tensions, particularly in middle-income countries; new demands on agriculture including biofuels and environmental services that create pressure on food prices and the 'threats' of climate change and increasing water scarcity. With agriculture still an important sector for the African economy, getting agriculture into a 'growth path' is increasingly becoming the core theme of policy documents, both from international donors and national governments. Emphasis is now being placed on efforts to develop 'pro-poor' agriculture contributing to 'pro-poor growth'

(OECD 2006). It is to these emerging debates that we now turn.

4.2. Key events in development policy: 2000's till present

Thus, African agriculture has returned to the international policy agenda in the context of climate change, the current food crises and the consequent demands for hundreds of billions of dollars in new investment in agriculture. Many international climate change processes are now focusing on agriculture and at the national level, African governments have also recently committed to allocate 10 per cent of GDP to agriculture (CAADP 2009). Before examining how climate policy processes intersect with the agricultural sector, it is important to understand the timeline within which these emerged and the parallel agendas that materialized during the same period. A brief review across these timeline allows for the identification of key events, when major shifts in the policy narratives occurred and how, as a result, the climate change debate intersects with the agricultural narratives.

In 2000 the shared objectives in the form of the Millennium Development Goals (MDGs), set to be achieved by 2015, provided concrete, numerical benchmarks for tackling extreme poverty. Within the MDGs agenda, the role of agriculture, in particular its role in ensuring food security emerged strongly.

Agricultural development will be the most important means of achieving the Millennium Development Goals with respect to the reduction of poverty and hunger (European Commission 2007).

With particular attention to the agricultural agenda, the MDG Task Force on Hunger (Sanchez *et al.* 2005) highlights seven actions to be taken at the national and state/district (community) levels. At the community-level actions include:

- Increasing the agricultural productivity of food-insecure farmers
- Improving nutrition for the chronically hungry and vulnerable
- Reducing the vulnerability of the acutely hungry through productive safety nets
- Increasing incomes and making markets work for the poor
- Restoring and conserving the natural resources essential for food security

Since the signature of the MDGs an array of donor driven initiatives have been taken up to ensure its achievement by 2015. In 2004, Kofi Annan, as then UN secretary-general, called for increased public-private partnerships to create an African 'new green revolution'. As a result, in less than two years, the Alliance for a Green Revolution in Africa (AGRA) alone committed US\$330 million in programs that address challenges across the agricultural value chain (AGRA 2010). New and substantial funding in agriculture research for development, for example, from the Gates Foundation has sparked interest among the global donor community. In particular, their support of AGRA – the Alliance for a Green Revolution

Figure 2: Key events within agriculture and development policy, 2000 - 2010

2000	Millennium Development Goals
2001	NEPAD - 3 rd IPCC Assessment Report COP7 – Marrakesh - NAPAs
2002	World Food Summit -
2003	CAADP established
2004	
2005	Paris Declaration – Aid harmonization and coordination UNFCCC Nairobi Work Programme – emphasis on adaptation and linkages to agriculture
2006	DAC policy guidelines – Pro-poor growth UNFCCC Nairobi Work Programme on impacts, vulnerability and adaptation
2007	IPCC 4 TH Assessment Report – focus on adaptation Bali Action Plan UN Human development Report on Climate Change
2008	World Bank World Development Report – Agriculture and Development IAASTD ¹ Report
2009	Global Forum of Agriculture - World Summit on Food Security – Climate Change, Agriculture and Food Security programme (CGIAR)
2010	World Development report – Development and Climate Change New international commission on sustainable agriculture and climate change

in Africa – opens up major opportunities (and challenges) in the world's poorest region. In the last decade, new institutional arrangements have emerged, including brokering organizations such as the African Agricultural Technology Foundation, as well as private philanthropy and development programmes associated in different ways with large multinational companies, such as the Syngenta Foundation or Monsanto's smallholder programme. The role of Public-private partnerships (PPPs) in agricultural R&D are increasingly viewed as an effective means of conducting advanced research, developing new technologies, and deploying new products for the benefit of small-scale, resource-poor farmers and other marginalized social groups in developing countries (Spielman *et al.* 2007).

Since 2005, the harmonization, ownership and results driven agenda, endorsed by donors and partner countries in the Paris Declaration has been 'reforming the way that the international development community works' (UK Food Group 2008). For example, leading donors came together and agreed to create a new mechanism, the Global Donor Platform on Rural Development (GDPRD), to coordinate their overall approach to agriculture development. In Africa, the Global Donor Platform for Rural Development (GDPRD), concentrating approximately 80% of total ODA in the field of rural development (UNECA 2007), is collaborating with NEPAD to support the CAADP and is providing joint support to the harmonization of donors' procedures and practices in rural development. The agreement of the MDGs, coupled with the a 'new aid agenda' that emerged with the agreement of the Paris Declaration, have been key factors in generating what is probably an 'unprecedented degree of

agreement' among donors over priorities and approaches (Farrington and Lomax 2002).

The OECD publication (2006), which called for a shift towards pro-poor growth in the Agriculture sector in Africa, shifted the agricultural-growth debates towards a pro-poor growth and Agriculture agenda, placing it as a significant means and ends to achieving the MDGs. This is especially stronger in DAC members and UN agencies. Donor policy strategies and programmes reflect the vital contribution of agriculture to pro-poor growth.

Evidence shows that it is agricultural growth, through its leverage effects on the rest of the economy that enables poor countries, poor regions and ultimately poor households to take the first steps in this process. Agriculture has in many places connected broader economic growth and the rural poor, increasing their productivity and incomes¹ (OECD 2006:3).

Following the signature of the MDGs, a 'global food' crisis hit the headlines. Although, as seen in the previous section, concerns about food production had been a long concern in African policy, the central question of the time became on how *global* food production may be increased to provide food for the coming 'population expansion' (Janvry and Sadoulet 2010). The African Union published a report on the Status of Food Security and prospects for Agricultural Development in Africa in collaboration with IFAD, FAO and WFP in July 2005 as part of the renewed political commitment to achieving food security (African Union 2005). These called for a "global" response to support food aid, nutrition and measures to increase agricultural output. Put it differently, food security had become a global concern that is seen beyond the scope

of any national government to address alone. Instead, international cooperation between states is seen to be required, rooted in a common commitment to the MDGs and sustainable development.

I hope that now - with the food crisis that has really had a tremendous impact on poor people in Africa - that there is a new realization that we need to re-engage with agriculture in terms of a political priority, in terms of a funding priority, and to get all hands on deck, whether they be government, aid donors, or the private sector (Lennart Båge² 2008: [page no.]

At the global level, the major centre of the debate was on strengthening food systems to secure the large-scale movement of safe food supplies. International agribusiness and food trading companies dominated this sphere (Scherr *et al.* 2010). This is, for example, reflected in the declaration adopted at the 2008 High-Level Conference on World Food Security, which committed Heads of State and Governments to a number of measures to address the challenges of higher food prices including providing balance of payment support, increasing investment in agriculture, and addressing obstacles to food access.

4.3. Climate change: The newcomer in the development agenda

Parallel to events shaping the development agenda highlighted above, the case for climate change was built. This is reflected in the recent policy statements that started to appear only after the Gleneagles Plan of Action (G8 2005) meeting, the most recent WRD (2010) dedicated to development and climate change and more recently the new international Commission on Sustainable Agriculture and Climate Change.³

Evidence for human-induced climate change had been mounting during the 1990s and continue to do so. However, arguments about its consequences and policy implications remain a focus of public discussion. The UN Framework Convention on Climate Change (UNFCCC) established in 1992 as the global policy framework and the IPCC the designated scientific body supporting the UNFCCC processes have been the key actors in driving the climate change narrative. Climate change impact models and more recently economic cost-benefit analysis (World Bank 2010b, Stern 2006, Agrawala and Frankhauser 2008, SEI 2009, Leary 1999) have become the dominant methods. These in turn have influenced global policies on how and when to respond to possible impacts and causes of climate change (Charlesworth and Okereke 2009).

Although both mitigation and adaptation action are required under the UNFCCC, the policies adopted throughout the 1990s tended to concentrate on the former (Swart and Raes 2007: 289-90). When adaptation was discussed in the international fora it was mainly in the context of developing countries, widely perceived to be more vulnerable to climate change impacts. The lack of policy on adaptation was interpreted as a political strategy by developed countries to avoid admitting liability and the financial consequences of this admission

(Schipper 2006). This in fact relates to the question regarding whose interests are met by pursuing an adaptation agenda. Adaptation has been characterized as a developing-country issue; however, developing countries have different priorities too. For those who already emit large quantities of greenhouse gases, adaptation may have been a useful measure to take the focus off mitigation discussions in the UNFCCC negotiations (Schipper 2006).

A tension between those in favour of mitigation over adaptation activities has strongly characterized the discourse on climate change policy (Schipper 2007). While since 1994 most of the debate and negotiations were devoted to negotiating the Kyoto Protocol (explicitly focused on reducing greenhouse gas emission) it is only recently that climate change policy has shifted towards adaptation and its linkages with sustainable development. The agreement on the 2001 Marrakesh Accords under the UNFCCC, which focus on adaptation as a policy response, culminated with approval and financing of National Adaptation Action Plans (NAPAs) by the Least Developed Countries (LDCs). The NAPAs were born as a technical priority setting exercise that aimed at placing adaptation policy at the centre of government priorities with the objective of determining country-specific impacts in-country. Nonetheless, the commitment to support the NAPA processes followed with a set of guidelines, activities and criteria for selection and immediate 'urgent' measures for enhancing adaptive capacity of countries, sidelining the role of local communities in these (Perch 2011).

The role of adaptation in development policy has continued to increase since 2001. A critical milestone for this was the UNFCCC Nairobi work programme⁴ adopted during the 2006 COP. Its main objectives are to a) improve the parties' understanding and assessment of impacts, vulnerability and adaptation and to b) assist in making informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis. The findings of the Fourth Assessment Report of the IPCC in 2007 re-emphasized the urgency of action and the scale of response needed to cope with climate change outcomes. Within this context groundbreaking decisions were taken in 2007 at the Bali COP 13, which included the launch of the Adaptation Fund as well as decisions on technology transfer and on reducing emissions from deforestation (UNFCCC 2007).

The need for adaptation has gradually come to be recognized as a policy objective within development planning. The main narrative put forward for adaptation policy recognizes that climate change is a global phenomenon with impacts at the local level and therefore those who are already the most vulnerable and marginalized will experience the greatest impacts (McCarthy *et al.* 2001) and are in the greatest need of adaptation strategies. It is within this narrative that the linkages with development and agriculture have intersected with the climate change adaptation policy. Sustainable development is presented as an overall policy goal of the UNFCCC where sustainable agricultural management has been identified by the Convention as a key sector towards this achievement⁵. Although

adaptation is seen as an important process to drive development, how to do this continues to be unclear. Adaptation has been embraced recently not only by the climate change community, but also by the development assistance community (World Bank 2010; DFID, 2005; UNDP, 2004; AfDB *et al.*, 2003). This is reflected in the numerous publications by development actors on the need for incorporating or mainstreaming adaptation in development policy and planning (OECD 2009, Olhoff and Schaer 2010) as well as practical tools and methodologies (Schipper 2007). Even the Adaptation Policy Framework, developed by the UN Development Programme/Global Environmental Facility (Lim *et al.* 2005) emphasizes the mainstreaming approach, as do the National Adaptation Programmes of Action guidelines for least developed countries (UNFCCC, 2001).

While the mitigation agenda has been characterised by highly political negotiations, contemporary adaptation policies debates are still grappling with the adaptation concept itself and what it means at policy and practical level (Who or what adapts--and how?). Commonly supported adaptation practices aim to lessen the impacts of increased atmospheric greenhouse gas concentrations, for example, through engineering and technological measures including new seed varieties, water management, and early warning systems (Smit and Wandel 2006). In contrast to this scenario-based "top-down" approach to adaptation, more recently, a development approach to adaptation is emerging in the policy debate (Smit and Wandel 2006, Huq and Reid 2007), which argues that beyond protecting the most vulnerable from potential climate risks, adaptation processes need to start at the community level and address developmental needs such as improving access to livelihoods adaptation. A community-based approach considers that adaptation strategies need to be generated through participatory processes, and address locally rather than being restricted to impacts-based scientific inputs alone (Ayers and Forsyth 2009)

It is within this contested field about approaches to adaptation that in Section 5 our analysis pays particular attention on how the concept is framed and what policies are supported. It has only been in recent years that climate change policy considerations has started to emerge within the development agenda and adaptation projects have mushroomed. Key milestones of climate change coverage within development was the 2007 Human Development Report 'fighting climate change' (UNDP) and the World Development report dedicated to development and climate change (World Bank 2010c). More recently, arguments for mitigation and adaptation to be both sides of the same coin are emerging. Whereas mitigation is widely framed as key to "sustainable economic growth" adaptation is framed as indispensable for human "survival".

4.4. Merging agendas: Agriculture and Climate Change

In 2008, for the first time in 25 years, the World Bank's annual development report (WDR) was dedicated to agriculture (World Bank 2008). Although climate change was not the main focus of the report, initial statements

and policy positions in relation to climate change and agriculture started to emerge, in particular, environment friendly solutions were proposed as an integral part of the future agriculture agenda:

Making the farming systems of the rural poor less vulnerable to climate change is imperative. Managing the connections among agriculture, natural resource conservation, and the environment must be an integral part of using agriculture for development (World Bank 2008:4)

The 2009 FAO World Summit on Food Security reiterated financial commitments made at the G8 meeting at L'Aquila, and laid out a map of five principles for sustainable food security. The agreed principles were: i) Invest in country-owned plans aimed at channelling resources to well-designed and results-based programmes and partnerships; ii) Foster strategic coordination at national, regional and global levels to improve governance, promote better allocation of resources, avoid duplication of efforts and identify response gaps; iii) Strive for a comprehensive twin-track approach to food security that consists of 1) direct action to immediately tackle hunger for the most vulnerable, and 2) medium- and long-term sustainable agricultural, food security, nutrition and rural development programmes to eliminate the root causes of hunger and poverty, including through the progressive realization of the right to adequate food; iv) Ensure a strong role for the multilateral system by sustained improvements in efficiency, responsiveness, coordination and effectiveness of multilateral institutions; and v) Ensure sustained and substantial commitment by all partners to investment in agriculture and food security and nutrition, with provision of necessary resources in a timely and reliable fashion, aimed at multi-year plans and programmes (FAO 2009a:3). The links between food security and climate change strongly emerged at the World Summit. This is reflected in the commitments agreed by all parties:

We commit to [...] Proactively face the challenges of climate change to food security and the need for adaptation of, and mitigation in, agriculture, and increase the resilience of agricultural producers to climate change, with particular attention to small agricultural producers and vulnerable populations (FAO 2009a:1)

The food security and climate change agenda have been rising to the centre of global discourse during the last decade and they have also become an issue of national policy within the African continent. This has led to a proliferation of international institutions, research institutions and new funders making the web of actor-network much more complicated to trace but at the same time reinforcing the narrative. The World Bank proposed a new deal on Global Food Policy to respond to the food crisis through social safety nets, increased agricultural production, and reduced trade barriers. The Bank also set up a Global Food Crisis Response Program (GFRP). Shortly after the dissemination of the WRD, the World Bank published its first publication examining the policy requirements to ensure food security in a changing climate (Tubiello *et al.* 2008) .

It is against this background that this research looks at the agriculture-climate change policy nexus. In particular it examines how the climate change agenda is shaping policy discourses, partnerships instruments and mechanism within the agricultural sector. The following section analyses in detail the different framings and policy solutions put forward by the principal actors.

5. Policy Narratives and Actor-Networks

Using the evidence⁶ gathered on donor policy discourse of the last five years and with a focus on the more recent declarations, this section is an attempt to give in a snapshot of the key developments, assumptions and prescriptions of donors in agriculture and rural development in Africa in the context of climate change. This section examines four intersecting narratives which seem to be dominating the policy discourse in agricultural development in a changing climate. Based on our review (see Annex 1), the current narratives on agriculture and climate change revolve around four main agendas: poverty reduction, economic growth, technology and innovation and sustainable land management. It is important to note that these narratives are intertwined within existing policy debates; but it is also the case that they promote different policies. These four narratives are presented below, with reference to a selection of documented sources where such a narrative (or version of) is evident. Examples of these are contained in Annex 1. In some cases differences are quite straightforward, in other cases they are more blurred. They suggest a particular set of solutions for sustainable agricultural development, but they also raise important questions: how do these narratives frame and structure the debate? How do they respond to the uncertainties involved in climate change predictions?

There seems to be a wide agreement that climate change presents a major threat to the growth of the agricultural sector in Africa and therefore there is a need to re-think the way investments in agriculture are done. Climate change is identified as a major threat to the development of the agricultural sector, as illustrated by the following quote: 'the climate is changing, and agricultural systems must also change if we are to avoid catastrophe' (Moorhead 2009). Climate change is also seen as an opportunity for new economic strategies that could speed up economic growth, one which 'the world cannot afford to miss' (Moorhead 2009). The convergence and divergence between the different narratives make the identification process difficult. There is a wide agreement that in spite of the limited contribution to the total greenhouse gas emissions, SSA countries are among the most vulnerable to climate change impacts. However, when it comes to identifying potential ways forward for the agricultural sector, different framings to the climate change challenge and its relation to the agricultural agenda emerge. The examination of the different types of threats and opportunities that policies aim to address has guided the identification and classification of four narratives.

5.1. The Growth Narrative

This narrative views agriculture as an engine for economic growth in Sub-Saharan Africa, (ASARECA 2008, WorldBank 2008, Fan *et al.* 2009, FAO 2009d) as it contributes around 40% to its gross domestic product and employs more than half of its total labour force (Barrios *et al.* 2008:287). The agriculture-climate change nexus is framed as follows: climate change poses an additional challenge to the agriculture-led economic growth agenda given its potential negative effects on agricultural production (FAO 2009d, Barrios *et al.* 2008:298, Brown and Funk 2008). For instance, a study carried out by Cameroon suggests that a 7% decrease in precipitation would cause net revenues from crops to fall US\$2.86 billion and a 14% decrease in precipitation would cause net revenue from crops to fall US\$3.48 billion (Molua 2009:205). On the other hand, climate change is also seen as an opportunity for economic growth given increasing climate funding pledges derived from mitigation mechanisms such as REDD+ which could compensate African countries for their contribution to mitigation through agriculture (Campbell, 2009). The argument goes on to say that since agriculture is simultaneously a source of –methane and nitrous oxides emissions – and a sink for greenhouse gases (GHGs), climate change offers new opportunities for economic growth within the agricultural sector. New climate change mitigation mechanisms provide opportunities to receive payments for environmental services related to agriculture. As such, it is argued that Africa needs to benefit from such mitigation potential by attracting investment in carbon trade related to agriculture (FAO, 2010a). This view is exemplified by the Ethiopian Minister of Agriculture's statement that through natural resource enhancement, risks are changed into opportunities from Clean Development Mechanism (CDM), REDD+ and others (Deressa 2010).

The central argument of this narrative is that agricultural growth can trickle down to the rest of the economy (IPCC 2007:273, Kabubo-Mariara and Karanja 2007:320). In addition, and in line with previous discourses of modernization, the problem framing focuses on the poor performance of agriculture in the region. This is explained as a result of the "backwardness" of the sector, in particular to a set of policy and technological failures that undermine production (Conway *et al.* 2010, NEPADKenya 2010). Thus, it is argued that developing SSA's potential is seen as crucial since 'yields are less than one-third of the maximum attainable yields' (ASARECA, 2008; COMESA, 2010). The growth narrative is legitimized by neo-Malthusian arguments where fast agricultural-led economic growth is seen as the means to cope with population growth and rising food demands (AU 2009). FAO (2009) projects that global agricultural production needs to grow by 70 percent by 2050, based on population and income growth assumptions as well as on dietary patterns. Furthermore, according to the African Union, the agricultural sector needs to grow much faster and maintain annual growth rates of about 6.2 percent in order to meet the Millennium Development Goal (MDG) of halving poverty by 2015 (African Union and FARA 2006). The integration of poverty reduction within the growth narrative represents a shift from the 1980s and 1990s

structural adjustment policies where fiscal balance was prioritised over poverty reduction (Maxwell, 2001).

The focus on agriculture-led economic growth emerges as a reaction to previous underinvestment in agriculture and to excessive emphasis on short-term measures such as humanitarian food aid (African Union and FARA, 2006; Conway *et al.*, 2010). The growth narrative has materialized through new policy commitments such as the 2003 African Union (AU) Maputo Declaration where all AU member countries have committed to increase investment in the agriculture sector to at least 10% of the national budget by 2008 increasing productivity by at least 6 percent (CAADP 2010). Key policy actors on climate change and agriculture are hence converging on the need to increase agricultural-led growth in sub-Saharan Africa and their priorities can be depicted within a four-pronged strategy: increased investment in research and technologies; improved agricultural inputs, techniques as well as infrastructure; appropriate macro-economic policies that are conducive to economic growth; develop the mitigation potential of Africa through agriculture (FAO, 2009). With climate change, solutions proposed revive some of the past narratives related to agriculture and add new elements as well:

In line with previous approaches to modernisation, increased investment in agricultural research and technology is seen as vital for greater productivity and therefore economic growth. As such, the African Union (2006) argues that lessons learned from the success of agricultural-led growth strategies elsewhere in developing countries show that productivity and overall growth in agriculture has been technologically driven, including the use of biotechnology. Thus, it is argued that research can provide new climate resilient crop varieties that are vital for agricultural growth and produce major economic gains (Vermeulen *et al.* 2010, WorldBank 2010ab). This view is materialised in the Comprehensive Africa Agriculture Development Programme (CAADP) Pillar IV to revitalise, expand and reform Africa's agricultural research, technology dissemination and adoption efforts (CAADP 2010).

New and better infrastructures as well as agricultural techniques are seen as the means to keep the pace of production needed to cope with climate change and population growth. For instance, the second CAADP Pillar seeks to accelerate agricultural growth by improving local infrastructure (CAADP, 2010). According to a study carried out by the International Food Policy and Research Institute (IFPRI), agriculture in the region is underdeveloped partly because African governments have devoted a low share of spending to agricultural and non-agricultural infrastructures, particularly transportation and communication, which gradually declined from 6.3 percent in 1980 to 3.7 percent in 2005 (Fan *et al.*, 2009).

Recognitions of tensions between a highly productive agenda and the transition towards low emission agriculture (African Union, 2009) have led to the introduction of concepts such as 'sustainable intensification' that implies key changes in agronomic practices (Godfray *et al.* 2010). Thus, key policy actors are hence increasingly acknowledging the need for a global shift towards a highly productive, intensified and

ecologically sustainable agriculture that can be achieved through new agricultural techniques (FAO 2009d, WorldBank 2010b). For instance, the World Bank (2010a) suggests a shift from monoculture, input intensification (pesticides, fertilisers) towards diverse, highly productive and less environmentally intense agricultural practices. FAO has proposed the African Union potential agricultural management changes including improved varieties, reduced/zero tillage, agroforestry, irrigation, water harvesting, watershed management, pasture and grazing management, restoring degraded lands. These techniques, that were already being promoted by FAO, gain momentum with the emergence of climate change concerns (AfricanUnion 2009).

The environmental sustainability of practices promoted under this narrative is questioned by Ensor *et al.* (2009) who are concerned that the recent widening of the REDD+ scope where agriculture is included would lead to an increase in monoculture and large land plantations. Another criticism to this narrative is that despite increasing possibilities for small farmers derived from the new REDD+ (such as alleviating poverty), there are almost no working models of Payments for Environmental Services (PES) related to agriculture in developing countries, probably partly a result of MRV being exceptionally difficult and costly (Campbell 2009).

Actor-network

The growth narrative has been adopted by a wide array of actors, including the World Bank, IFPRI, IFAD, FAO, USAID and regional bodies as well as sub-regional bodies such as the African Union and COMESA. All actors converge on the idea of developing the potential for agricultural mitigation in Sub-Saharan Africa and on the concerns about the economic losses derived from the negative impacts of climate change on agriculture (ASARECA, 2009). Notwithstanding, actors within this narrative have different views on the techniques that should be used to achieve agricultural-led economic growth. IFAD (2009) suggests that with the right input such as appropriate irrigation and fertiliser the amount of arable land could be increased five to six times.

On the other hand, other international organizations recognize that former agricultural practices, such as inorganic fertilisers or pesticides have caused ecological damage, degradation of soils (FAO, 2010a). In addition, there is no agreement on the role of ministries of agriculture as opposed to the role of the private sector in agriculture-led economic growth. Other tensions include how central agriculture should be in the growth strategy of Sub-Saharan countries. Although all actors view agriculture as an engine for economic growth in SSA, there is still some divergence on how central the sector should be. For instance, whereas the World Bank (2010b) supports the diversification of the economy within the context of climate change, the African Union sees agriculture as central within the region's development strategy (AfricanUnion 2009).

Box 4: Climate Smart Agriculture

Under an agenda which integrates sustainability, productivity and climate resilient agriculture the term 'climate smart agriculture' has emerged. Climate smart agriculture is part of a broader term, a 'climate smart world', which not only encompasses agriculture, but also other aspects of climate change such as 'climate smart cities' or renewable energies (World Bank 2010d). The World Bank (WB), in its forthcoming World Development Report (2010e), has recognized the need for a 'climate smart world' where 'developing countries can shift to lower-carbon paths while promoting development and reducing poverty, but this depends on financial and technical assistance from high-income countries' (World Bank, 2010a).

Climate smart agriculture has been defined as 'agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes GHGs (mitigation), and enhances achievement of national food security and development goals' (FAO, 2010a:2). The term has become common amongst policy actors and it is related to the idea of taking climate change as an opportunity rather than as a problem. Therefore, climate smart agriculture implies recognising the benefits of agriculture to combat climate change such as the huge mitigation potential of agriculture in developing countries. Thus, for FAO 'the twin battles to improve food security for a growing world population and contain climate change can be fought on the same front' (FAO 2009b). Achieving climate smart agriculture can be done through improving natural resources management with CDM or REDD+ (Deressa 2010; Georgis 2010).

5.2. The end of poverty' narrative

Since the agreement of the MDG target of halving poverty by 2015, agriculture has emerged again as a key sector to overcome poverty. The central argument is that no country has been able to sustain a 'rapid' transition out of poverty without raising productivity in its agricultural sector (Lipton 2005).

'More than in any other sector, improvements in agricultural performance have the potential to increase rural incomes and purchasing power for large numbers of people to lift them out of poverty' (NEPAD 2002, Wiggins 2006).

The link between productivity levels and poverty reduction is the main focus of this narrative. The agriculture – climate change nexus is framed as follows: climate change presents a major threat to agricultural productivity and hence it poses serious risks to ending poverty. It is argued that if agriculture becomes more sustainable, if it increases its productivity and becomes more resilient against the impact of climate change, this would help to reduce poverty levels and offer better income and job opportunities. Much of the data to sustain this argument presents poverty and productivity levels along with climate change impact scenarios data.

This in turn is interpreted as implying a particular type of investment and support for a particular approach to the adaptation strategies in the agricultural sector. The policy message that surfaces from this is clear: a risk management approach towards climate change impacts through adaptation strategies can ensure higher food productivity levels, which in turn result in lower levels of hunger in increasing small farmers incomes and asset base.

The end of poverty narrative frames food security as a means to ending hunger and poverty and therefore to achieve this first and foremost, a drastic increased investment in agriculture to feed a growing population is needed. This narrative frames food security in a broader perspective by arguing that it depends more on socio-economic conditions than on agroclimatic ones and on access to food rather than the production or physical availability of food' (FAO, 2008). It not only focuses on agricultural production, but also on nutrition. Thus, it also recognizes the importance of the stability (or variability) of food supplies and access (dependent on seasonality, food production, incomes, markets and social entitlements) and access to food (dependent on purchasing power, market integration and access to markets).

Box 5: Small Farmers

Helping small farmers to adapt is a prime focus of many adaptation projects. With this objective, it is argued that historically, African communities have developed local adaptation strategies to cope with climate variability and extreme weather events. To serve as a valuable input to adaptation policies, however, this local knowledge must be strengthened through risk management and capacity building activities such as climate information. As a result, 'the end of poverty narrative' calls for national governments, NGOs, and international institutions to direct funding and resources into building the necessary adaptive capacity and risk management structures.

'Learning what farming practices work best in changing climates and putting those changes into practice is an important part of adaptation' (IDRC and DFID 2007 :10)

This narrative presents small-scale agriculture as the best route out of poverty for the poorest. Small-scale agriculture plays an essential role in reducing poverty and improving food security for rural and urban people; therefore, it is argued, that policies need to focus on producing growth while benefiting urban and rural people. The need is agri-food policies that build the capacity of African countries to adapt to climate change in ways that benefit the most vulnerable. It holds that this must be in combination with off-farm activities and urban, industrial growth, but that the initial motor for economic growth and livelihood improvement must come from a productive agriculture. This narrative argues, instead, that solutions must come from an understanding of local contexts, drawing on indigenous knowledge. Top-down solutions are therefore rejected in favour of more participatory solutions, involving local consultation and village level planning. However, this approach seems to be limited to scattered projects and does not translate into policy statements or measures.

Under this narrative, suggested adaptation strategies centre on increasing agricultural productivity and making agriculture, including livestock, fishery and forestry, less vulnerable to climate stress and shocks. This narrative holds therefore that adaptation measures are required in order to reduce the risk of climate change impacts (i.e. droughts, soil erosion) and subsequent decrease in productivity. Indicators of vulnerability are associated with levels of production, farm income and availability of food. Because poverty is identified with production constraints, which is now at risk of climate change, such interventions take the form of technological transfers/ changes in agriculture. Adaptation, including crop choice and timing, is seen as essential in order to compensate for production declines. Decreases in output levels are framed as a risk management problem that is exacerbated by climate change. Adaptation strategies that enable production levels to be constant and building adaptive and risk management capacities of small farmers are the proposed way forward.

Actor-Networks

Because of the commitment to the MDGs, the pro-poor growth agenda and the 2008 WRD, all particularly led by the donor community, the 'end of poverty narrative has been significantly pushed forward by NGOs and donors. With agriculture and food security back on the political agenda, donors are recognizing the links between agriculture, food security and climate change. In particular, since IPCC's fourth assessment report, adaptation to climate change is given increasing recognition and hence priority within policy statements and strategies within the agricultural sector. However, very few policy documents refer to adaptation planning processes (i.e. NAPAs) or mechanisms.

In a political climate dominated by the Paris Declarations and therefore donors' commitment to coordination and harmonization, donor agendas tend to translate into a high degree of agreement between donor policies. As a result little space seems to be available for views on adaptation in the agricultural sector outside this risk-based approach narrative. At the global level, The Global Platform for Rural Development (GPRD) leads this discourse. These arguments are echoed and reinforced at regional and national level through strong political statements at regional and national levels through the NEPAD-CAADP agenda. For example, CAADP's pillar 3 (increasing food supply and reducing hunger) which seeks to achieve agricultural growth, and the Millennium Development Goals' targets for addressing poverty and hunger (MDG 1 aims to cut extreme poverty and hunger in half by 2015), has become the centre of most donors' narratives, policy decision-making and funding.

5.3. The Sustainable Land Management (SLM) narrative

Alongside the policy debate about poverty and food security, there is a very influential concern about the impacts of climate change on the natural resources upon which agriculture depends. While the previous narrative framed the climate-agriculture nexus within a

poverty-production frame, the SLM narrative puts production processes and levels within a broader land and environmental management approach. An example of this view is the following quote:

'African farming is often of low productivity because it does not employ environmentally sustainable farming methods, including appropriate use of fertilizer and improved seeds, better soil conservation practices, improved fallows and rotations' (World Bank 2005)

The narrative goes as follows: in sub-Saharan Africa, agricultural production depends upon natural resources and the livelihoods of millions of people are highly dependent of increasingly unpredictable climatic conditions.. Many of the problems associated with the poor performance of agriculture are rooted in poor management of natural resources. Thus, land degradation is compromising the sustainable livelihoods and the economic growth potential of their countries. Much of the growth in agriculture across Africa – and growth performance has been poor – has often been through expansion of area of cultivation not through productivity gains. For example, water resources management is a major constraint to boosting agricultural performance and compromises natural resource management. As the health of its soils, forests and fisheries decline, the region's ability to sustain its growing population is becoming strained beyond capacity. It is then argued that, environmental degradation is exacerbated by climate change impacts, as illustrated by this quote:

'Climate variability and change can contribute to land degradation by exposing unprotected soil to more extreme conditions and straining the capacity of existing land management practices to maintain resource quality, contributing to de-vegetation, soil erosion, depletion of organic matter and other forms of degradation' (TerrAfrica 2009)

Food security is framed as a challenge for environmental sustainability, and hence ecologically sustainable agriculture (Muller, 2010) and climate change adaptation as well as mitigation (FAO, 2008) are the proposed ways forward. Climate change, the argument goes, leads to a rethinking of agricultural practices and their environmental costs. This implies a shift from conventional practices (regular fertiliser use, no water control, plough tilling, monoculture) towards more sustainable agricultural practices (conservation tillage, judicious use of fertilisers, water management/irrigation and improved farming systems with several crop rotations, sustainable agricultural land management). Sources of scientific authority for the SLM narratives are drawn from population growth figures, statistics of declining yields and data about the levels of desertification and deforestation. The use of such data enables this narrative to emphasize devastation and human-ecological decline. However, climate change projected scenarios and the prevailing uncertainty around them are not presented as the 'scientific' evidence to support such policy messages. Nonetheless, this narrative holds that land degradation coupled with increased climate variability, low agriculture and livestock yields and high rates of

Box 6: Conservation agriculture and the SLM narrative

Concerns about land degradation and water systems led to the emergence of a sustainable-productive agricultural agenda. One of the main solutions proposed to achieve this is Conservation Agriculture (CA). CA aims to achieve sustainable and profitable agriculture and subsequently aims at improved livelihoods of farmers through the application of the three CA principles: minimal soil disturbance, permanent soil cover and crop rotations' (FAO 2010). Its origins come from the 1930s Dust Bowl in the United States where excessive soil tillage led to high levels of erosion and decreased productivity (Warren, 2005). As a result, a new agricultural technique was introduced, conservation tillage (CT). In CT no-till, mulch, and rotations significantly improve soil properties (physical, biological, and chemical) and other biotic factors. Thus, CT is said to enable more efficient use of natural resources. However, it is argued that CT still contributes to soil disturbance since it depends on tillage as the structure element in the soil (Hobbs 2007). Conservation agriculture reduces the negative elements of CT and increases its benefits (Hobbs et al. 2008).

CA is seen as an imperative in the present context of increasing population growth and food demand, growing competition for water resources, concerns about climate change and increases in severe climatic events (Hobbs, 2007). In the African context of increasing food insecurity and loss of Africa's agricultural resources reducing tillage becomes a key strategy to address these issues (Fowler and Rockstrom 2001). Hence CA is seen as crucial for climate change mitigation as well as adaptation since it increases carbon sequestration in soils (Fowler and Rockstrom, 2001). For instance, according to NEPAD, 'CA is the most beneficial sustainable land management (SLM) strategy and practice in most areas of Sub-Saharan Africa since it can enable farmers and communities to become more resilient to climate change' (Woodfine, 2009). FAO also states that CA can lead to a decrease in CH₄ and N₂O emissions since 'the use of fertilizer and agrochemicals can be reduced in the long term by 20 per cent' (FAO 2008a).

Other benefits associated to CA include its cost-effectiveness. The World Bank suggests that conservation agriculture overcomes the critical labour peaks of land preparation through weed control, cover crops. Thus, in recent years CA has become increasingly popular since it and it is being promoted with Brazil as the example of best practice. As such, in 2007 FAO developed a project where Kenyans and Tanzanians would learn the CA practices developed in Brazil with the objective of up-scaling lessons learned (FAO 2007b). The World Bank has also sought to mime the Brazilian success in Tanzania with a CA project (World Bank 2010b).

deforestation, calls for a new land management approach. It identifies problems of desertification, deforestation, soil erosion, water resource depletion and soil fertility decline and food security as interconnected.

Immediate action is needed to strengthen the resilience of agriculture to the challenges of climate change and natural resource degradation, while sustainably improving the productivity of agriculture in the face of growing demand for food (IFAD 2010:1).

Examination of donor and government policy documents suggests that it is assumed that population growth, combined with bad natural resource management practices, a lack of technology innovation and climate stressors are contributing to environmental degradation. As the problems are perceived as being interconnected, they require integrated solutions, rather than approaches that isolate one specific issue. Solutions proposed include investments in sustainable and ecosystem; land management practices; rehabilitate soils, watersheds, grazing lands, forests; water efficiency; diversify production; organic, regenerative, or conservation agriculture; diversify products and varieties; participate in carbon markets and CDM funding. It argues that, SLM approaches offer multiple pathways to mitigate impacts of climate change while facilitating adaptation processes.

The policy message that comes from this narrative is clear: local agricultural practices are deteriorating the environment from which agriculture depends, and climate variability and change will exacerbate such processes. New techniques, technologies and practices are thus required to avoid further degradation and to effectively adapt to the changing climate. It could be argued that central to this narrative is a technical view of understanding the environment, limited to an understanding of the environment as natural factors,

that can be addressed through technical modernization for better land management practices (soils in particular feature prominently) but with little acknowledgement that natural resources are inseparable from and encumbered by social, political and economic factors (Keeley and Scoones 2003). This is reflected, for example, in the fact that current policy papers and analyses do not explore issues of land ownership, access or control of natural resources.

It seems that under the SLM label, the old 'environmental rehabilitation narrative' that emerged from the 1980s with a strong and influential actor network involving natural scientists, sections of the government, a range of international NGOs (post 1984 famine), and 1990s with the support of environmental protection agencies (Keeley and Scoones 2003) continues to prevail. It could be argued that climate change has offered a policy space through which the SLM approach continues strong and influential. This is in spite the number of critiques that emerged in the mid and late 1990s questioning the accuracy of the data and the policy approach under the environmental rehabilitation narrative' (Keeley and Scoones 2003).

'Climate change can offer new opportunities for productive and sustainable land management practices, such as reforestation, improved water management, integrated soil fertility management, conservation agriculture, agro-forestry, improved rangeland management and others as a result of changing biophysical or market conditions' (TerrAfrica 2009).

Actor-Network

The SLM is a recurrent narrative across a wide range of stakeholders. The actor network involves national and regional level actors; bilateral and multi-lateral donors

and financial institutions. These institutions include economists, agriculturalists and environmentalists. SLM approaches can be found in a wide variety of projects and programmes from actors such as the EU, UNFCCC, UNDP and other UN agencies. The increasing funding support for SLM approach can be found through a variety of financial and platform networks, which highlights the policy influence of this approach. In the international arena, for example, the Convention to Combat Desertification (UNCCD) is one of the most important/influential players promoting the SLM approach. The GEF directly contributes to objectives of the UNCCD through the LD FA (Land degradation focal area). The Global Environment Facility (GEF) also provides US\$150 million in umbrella funding for SIP (Strategic Investment Partnership for Sustainable Land Management). The GEF has also mobilized significant co-financing, making the programme the single largest effort to restore soil fertility and prevent land degradation in Africa. The distribution of GEF funding by land use type confirms that the focus of GEF investment has been in the agricultural sector (\$193.11 million – 59%) of which \$150 million went to investments supporting SLM innovations in countries in sub-Saharan Africa through the SIP (UNCCD 2009).

The actor network expands further through the TerrAfrica multi-partner platform. SIP is also a key activity of TerrAfrica. TerrAfrica has been developed as a multi-partner platform and a primary vehicle for consultation and action with the direction and support provided by a group of African governments, NEPAD, the World Bank, the UNCCD's Global Mechanism (GM), the UNCCD Secretariat, the GEF Family, IFAD, the FAO, UNEP, AfDB, regional and sub-regional organizations, as well as multilateral organizations including the European Union and the European Commission, bilateral donors, civil society and scientific organizations including FARA and CGIAR centers.

5.4. The New African Green Revolution narrative

This narrative views the 1960s South Asian Green Revolution as a model for small farming development in sub-Saharan Africa. The need for a Green Revolution is influenced by a problem framing that identifies key challenges within small farming systems including low-yield productivity levels, input constraints and “backwardness” (Warren 2005, Conway 1997, World Bank 2008, Jayne *et al.* 2010, Hazell 2009).

As within the green revolution project for SSA in the 1970s, the main assumption is that overcoming these challenges will depend on farmers' transition to modern agriculture. Their success will hence depend on new programmes that provide small farmers with what ‘they need to succeed’, including the use of technology, input intensification, access to markets and credits and appropriate agricultural techniques (Annan 2010). For instance, IFPRI suggests that unless farmers have access to more productive technology the effectiveness of policies in increasing agricultural production will be limited (IFPRI in Devereux, 2000). The Mozambican Minister of Science of Technology argued that a Green Revolution would only be possible if scientists breed

high-yielding varieties of crops to relieve hunger in rural areas (Massingue in SADC 2008). The New African Green Revolution narrative is also influenced by previous soil degradation discourses with the promotion by key policy actors of soil and water conservation techniques such as conservation agriculture (see box 2) (AGRA 2010, FA, 2010; World Bank, 2010e).

Proof of the support for the ‘New African green revolution’ narrative are policy commitments such as the 2007 Abuja Declaration on fertilisers for an African Green Revolution where governments in the region pledged to increase fertiliser use from 8.0 kilograms to 50.0 kilograms per hectare (AUC, 2007). Despite the fact that agroecological alternatives to production have not yet become mainstreamed as a strategy to achieve an African Green Revolution, some policy-actors are calling for more environmentally sustainable inputs. For example, FAO (2009) argues that while large-scale use of artificial fertiliser made the green revolution possible, it led to a great amount of nitrous oxide emissions. In addition, the World Agroforestry Centre is promoting the concept of ‘Evergreen Agriculture’ where planting some tree species such as acacia among the crops can automatically fertilise the fields (Garrity *et al.*, 2010). With climate change there is also growing conviction on the need of international cooperation which could help farmers adapt to climate change through existing climate change mechanisms (Annan, 2010; AUC, 2010).

The ‘New green revolution Narrative’ views food production as the key to achieve food security (IFPRI in Devereux) which is threatened by increased frequency and intensity of climatic events (Chishakwe 2010). Although many factors are said to be affecting food security, this narrative often focuses on underproduction, overpopulation (World Bank, 2010b; FAO, 2010a), backwardness (NEPAD, 2001) and policy failure. Thus, it is argued that in order to achieve food security:

‘agriculture in developing countries (especially smallholder systems in agriculture-based countries) must undergo a significant transformation in order to meet the related challenges of food security and climate change’ (FAO, 2010a).

This narrative tends to depoliticise food security and proposes technical solutions and policies focused on agricultural productivity enhancement. This generally includes improved technologies and agricultural practices such as sustainable land and water management, increased agricultural inputs, climate resilient crop varieties, adoption of high-yielding technologies (including biotechnology) and weather forecast (GAFSP 2010, Kiome 2010). From this perspective, it is vital that small farmers become knowledgeable about these techniques (Horna *et al.* 2010).

The new green revolution focus on small farmers has led to the inclusion of farmers' dignity, participation and local knowledge in policy discourses (Annan, 2010; Deressa, 2010; GOM⁷, 2010; IFAD, 2010). However, there seems to be a disjunction between the discourse and the policy as the focus on input intensification and technology remains. Thus, as during the 1990s, the New African Green Revolution narrative has been criticised for undermining farmers' constraints to production and

the unique features of the sub-Saharan African context (Warren, 2005:6; Mortimore, 2010). From this perspective, food supply deficits in SSA are not prompted by one factor (i.e.: low use of inputs or lack of technologies), but by the interaction of different social, environmental, economic and political factors (Devereux, 2000; Koning and Smaling, 2005; Scoones, 2007:316-319). Critiques also suggest that while technology may be necessary, local knowledge and adaptive capacity should be the ground for policy implementation.

Actor-Networks

Key networks to follow this narrative are the African Green Revolution Forum and AGRA. Both initiatives involve different actors including the International Fund for Agricultural Development (IFAD), private donors such as the Rockefeller Foundation and Melinda and Bill Gates Foundation, the chemical company YARA, and financial institutions such as the African Development Bank group and the Standard Bank (AGRF 2010).

6. Discussion and Analysis

The examination of dominant narratives in contemporary agricultural development policies suggests that a complex configuration of new actors and interests are involved in agricultural development policies in the context of climate change. As illustrated in table 2 below, the complex actor-networks engaged in the policy debate are organized around four simple yet powerful narratives (growth, end of poverty, sustainable land management and new green revolution) that define their position in relation to the other actors in the policy debate (Keeley and Scoones 2003; Hajer 1995). The first

narrative has been identified that sees the lack of agricultural productivity as the key challenge in Sub-Saharan Africa, which is accentuated by climate change. The story line is further elaborated by framing increased production as key to achieving the green revolution, economic growth and food security. Such framing seeks to justify technical interventions based on introducing seeds and fertilizers, which equate adoption of seeds and inputs with increased food production and rising productivity. These sets of narratives are concerned with supply chains and private sector led developments that create new investment opportunities for farmers, facilitate poverty alleviation, and create markets that work for the “poor”. Climate change is seen as both a threat to raising productivity levels and as an opportunity to achieve a highly productive-sustainable agenda where small farmers’ participation is seen in an instrumental way to increase agricultural production. This approach is being mainly promoted by IFPRI, the World Bank and it is being advocated by some African governments such as the Ethiopian government.

Into this is woven a second set of narratives associated with the i) looming food and ii) environmental crisis – exacerbated by climate change – that undermines previous investments in poverty reduction (end of poverty narrative) and environmental rehabilitation in Sub-Saharan Africa (sustainable land management narrative). These two narratives frame climate change as a key challenge to environmental sustainability given the importance of agriculture in Sub-Saharan Africa and its relation to the livelihoods of many small farmers. Climate change mitigation and adaptation mechanisms are framed as a window of opportunity for small farmers to both adopting new practices and switching to alternative energy solutions. Climate change is also seen

Table 2: Summary of Policy Narratives

Narrative	Framing of the problem	Policy Foci	Key actors
Growth	Agriculture is an engine for growth in SSA. Climate change provides key challenges but also opportunities to achieving growth and develop the agricultural sector	Food production; agricultural infrastructure, technology and access to markets; mitigation	IFPRI, IFAD, the World Bank, FAO, USAid, Regional and sub-regional African bodies
The end of poverty	Climate change presents a major threat to agricultural productivity and hence poses serious risks to ending poverty and achieving the MGDs	Protecting the ‘poor’ through risk management and social protection ; Enhancing and adapting agricultural productivity through ; Investing in technologies to inform crops and livelihood diversification,	Development donors, INGOs
Sustainable Land Management	Local agricultural practices are deteriorating the environment from which agriculture depends, and climate variability and change will exacerbate such processes. New techniques, technologies and practices are thus required to avoid further degradation and to effectively mitigate and adapt the changing climate.	Improve land management practices though better use of technology; rehabilitate soils, watersheds, grazing lands, forests; water efficiency; diversify production; organic, regenerative, or conservation agriculture; diversification of products and varieties	GEF, IFAD, CGIAR and UN agencies – in particular UNCCD, FAO,
Green revolution	Overcoming challenges posed by climate change related to agricultural production will depend on farmer’s use of technology.	High-yielding packages; improved seed varieties; input intensification; improve farmers’ access to markets; climate information technology	AGRA, IFAD, YARA, Melinda and Bill Gates Foundation, AfDB

as an opportunity to increase the use of agro-ecological practices that are already being promoted for other reasons than climate change. Within the process of agricultural development under climate change the public sector is regarded as essential but the private sector also plays an important role. Hence, there is a need to develop and support public-private sector partnerships. This approach is frequently employed within policy actors such as United Nations agencies, especially FAO.

Finally, the examination of the dominant narratives has also led to the identification of a major counter-narrative which is concerned with poverty levels as well as ecology and proposes solutions that emerge from the bottom-up. This implies valuing indigenous knowledge within agricultural as well as climate change policies. Thus, it proposes solutions such as community-based adaptation and promotes social participation (including farmers' participation) as a key aspect within climate change and agricultural policy-processes. This approach is generally supported by civil development cooperation organizations and civil society organizations.

These narratives work together to justify a particular set of interventions geared towards promoting an increase in funding in agricultural development.

'...negative impacts from climate change come at a time of rising demand for agricultural productivity growth. Future productivity gains will need to offset the productivity loss from climate change and still generate sufficient gains to meet rising food needs—a double challenge. The estimated incremental annual investment needed in Sub-Saharan Africa ranged from US\$3.8 to US\$4.8 billion (World Bank 2010a).'

Agricultural development policies in the context of climate change engage with a wider range of framings of agriculture than was previously the case. We suggest that this process shapes the way "new" policy narratives emerge, but is also obscures the predominance of particular ways of thinking about the role of agriculture. As indicated in table 1, it is possible to identify differences between these four narratives. However, beyond examining the contrasts between them, our analysis also points to connections and overlaps through the identification of common understandings and assumptions. It is to the underlying assumptions between these overlapping narratives that we now turn.

6.1. The persistence of old arguments under the umbrella of climate change

Reflecting on the identification of the 4 major dominant narratives identified above, policy positions converge around the idea that the core challenges of climate change adaptation and mitigation in agriculture is to produce: (i) more food, (ii) more efficiently and sustainably, (iii) under more uncertain production conditions, and (iv) with reductions in GHG emissions. With growing agreement over the threats climate change poses to food security as well as on the need to take action (FAO, 2010a) the issue of global food security is gaining momentum with new policies and measures being put in place. Despite global recognition of the need

to achieve food security, policy solutions continue to be contested as actors involved have different conceptions, expectations and proposals on how to achieve food security. Nonetheless these narratives, we suggest, do not contradict per se, but reflect different emphasis. Differences are defined at the margins and to some extent 'toned down' by the prevalence of Malthusian diagnosis of over-population, impending crisis and the dominance of impact-centred analysis of vulnerability. In short, despite critics, the most influential argument in the climate change and agriculture policy debate in SSA is that population growth coupled with climate change impacts places the region in an unprecedented environmental and food insecurity crisis. It is significant that all policy statements make reference to statistics that highlight the need to meet the food demands of a world population expected to reach 9 billion by 2050 in a context of high climate variability.

'Food production in the developing world must more than double over the next twenty years to keep up with population growth' (CIDA 2009).

'Agriculture – on which we all depend for our food – is under threat from climate change [...] Feeding a rapidly rising global population is taking a heavy toll on farmlands, rangelands, fisheries and forests (Moorhead 2009:1)'

Commonly held assumptions across the four narratives, translates into similar policy solutions that, while facilitating a specific set of interventions (which reflect the agendas of the actor-network), promote the reinforcement of traditional thinking in the agricultural sector and as a result sideline other narratives on climate change and agriculture. This is particularly evident in relation to the emphasis of food production, the need for innovation technology and the importance of economic growth and market led approaches. These general policy solutions – identified across the four narratives – sound familiar to previous thinking in agricultural policy presented in section 2. In spite of considerable uncertainty and lack of research into the local consequences of climate change, the identification of local risks, and the scoping and implementation of possible policy strategies (England 2007), many of the foundations of agricultural development thinking of the 1950s continue to underpin contemporary agricultural development policy. We suggest that under the umbrella of 'climate change' the revival of orthodox thinking is legitimized, in which economic growth and modernization continue to be seen as the solution to agricultural development, reducing poverty and achieving food security in a changing climate. The "supremacy" of expert knowledge, predominance of risk management approaches and the prevalence of neo-liberal thinking continue to dominate the political space within which climate change comes to be framed in relation to agricultural development policies.

Expert knowledge and climate modelling

The climate change debate has provided space for a revival of different framings of the agricultural sector

vulnerability to climatic factors. As illustrated in the analysis of dominant narratives, vulnerability of agricultural sector is largely framed by three aspects: i) the sensitivity of production, ii) the natural resources upon which agriculture depends and iii) farmers vulnerability. These framings in turn, are supported by different statistics put forward by different actors to support such arguments. In short, political differences are played out through the use of scientific knowledge. However, the impact of climate change on agricultural production is one of the most widely-agreed across actors and narratives. The framing of vulnerability to climate change - highly influenced by natural-scientist and the IPCC - has provided the political space to favor technical issues in analysis and development of mitigation and adaptation solutions (Tanner and Mitchell 2008:9). Such framing translates into a wide agreement across policy statements that a productivity "revolution" is now required in the context of climate change if substantial poverty reduction is to be achieved.

Even without climate change, greater investments in agricultural science and technology are needed to meet the demands of a world population expected to reach 9 billion by 2050. Many of these people will live in the developing world, have higher incomes, and desire a more diverse diet. Agricultural science- and technology-based solutions are essential to meet those demands' (Nelson et al. 2009:viii)

Although in recent years, the need for a holistic and systemic approach to vulnerability within the literature has emerged, the focus on vulnerability in climate change policies in the agricultural sector still tends to narrow the vulnerability of the this sector down to climatic factors.

Climate variability lies behind much of the prevailing poverty, food insecurity, and weak economic growth in Africa today. Climate change will increase this variability. The severity and frequency of droughts, floods and storms will increase, leading to more water stress. Changes in agricultural, livestock and fisheries productivity will take place, and Africa will face further food insecurity as well as a spread of water-related diseases, particularly in tropical areas (UNECA 2009:2).

This narrow framing of SSA's agricultural vulnerability generates silence surrounding the potential trade-offs in policy making. Although there may be several reasons underlying this silence – which go beyond the scope of this research - a narrow framing of vulnerability only contributes to perpetuate such salient vulnerability to climate change which, in turn, allows the objectification of climate change as an external threat to agricultural growth and poverty reduction. As a result, mitigation and adaptation strategies can be neatly defined as strategies to reduce overall threat and to cope with climate risks.

However, as highlighted in section 1, policy decisions on adaptation to and mitigation of climate change are highly political – which may involve a range of trade-offs. In particular, there is a growing body of literature which argues that decision-making in relation to adaptation strategies will inevitably involve conflicts of interest,

where adaptation efforts may benefit some (winners) but increase the vulnerability of other groups (losers). From this perspective, it is of critical importance that policy spaces are identified for different actors and groups to negotiate their interest – in particular of those most vulnerable. However, a debate dominated by natural scientist on the one hand, and economist on the other, blocks out such space. An apolitical framing of climate change thus presents science as providing knowledge (i.e. emission reduction targets, vulnerability indices) which can be translated into a specific set of policies and legitimize policy positions. However, the politicization of such knowledge also serves to legitimize the persistence of narratives that frame farming practices unsuited to new climate; and farmers who lack skills, knowledge and information. This translates into few global players who dominate the policy space and who propose universal rather than local and context specific solutions. In short, the power of scientific expertise continues to dominate the policy space and the knowledge of some groups continues to hold more validity than the knowledge of others. This is in spite of the emergence of a newly forming counter narrative – community based adaptation – strongly supported by civil society and academic research institutions which argues that adaptation strategies must be generated through participatory processes, involving local stakeholders and development practitioners, rather than being restricted to impacts-based scientific inputs alone. Central to this narrative is that expertise in *vulnerability reduction* must come from local community-based led adaptation and indigenous knowledge of locally appropriate solutions to climatic variability and extremes.

Arguments within counter-narratives in the 1980s and 1990s (including the vulnerability of farmers, the need to recognize indigenous knowledge and participation) are being adopted in the language of key policy actors. The absorption into dominant narratives of keywords associated with counter-narratives has served to qualify, not dislodge, its foundations. While the use of such words is becoming generalized, counter narratives that promote increased participation of small farmers and the recognition of their knowledge still remain marginal. Moreover, it is unclear how technological approaches proposed by the new African green revolution will integrate the knowledge of African farmers. Growing recognition of the relevance of agro-ecological narratives leads to a contradiction. Since agro-ecology is necessary and has been practiced for many years by African farmers, why is farmers' knowledge not being increasingly considered in policy-making? Findings in this paper suggest that there still is a generalized tendency to alienate indigenous from conventional knowledge systems.

Managing risk rather than dealing with uncertainty

A second assumption underpinning contemporary narratives is the overall premise that climate change can be "managed" to achieve predictable outcomes (i.e food security, poverty reduction) – highlighting how equilibrium thinking and a sense of predictability and stability continue to dominate. As highlighted in section

2, how knowledge claims about future climate uncertainties are assimilated into the narratives is of great importance. Central to an understanding of how scenarios of future climate are used is an appreciation of the ways in which they characterize uncertainty. Although it is important to acknowledge that the long-term horizon associated with climate change poses significant challenges for the planning horizons of policy-makers, a common thread across the four narratives is the recognition of climate uncertainty at the margins. On the one hand, this translates into a set of policies characterized by its short-termism with particular focus on the impact of extreme events rather than long-term gradual changes – giving climate change a sense of urgency coupled with disaster related policies such as early warning systems and seasonal forecasts. Framings of risk tend to adapt hazard-centered or impact-oriented approaches, focusing largely on the physical processes underlying vulnerability to climate change and disasters. On the other hand, “lack of information” about future climate scenarios is used to justify further investments in climate modelling in order to improve prediction and to call upon science and technology to provide scientific innovations that can protect farmers from future threats and manage potential risk.

Innovations in agriculture have always been important and will be even more vital in the context of climate change’ (Lybbert and Sumner 2010:vii).

African countries lack the means, technology and institutions to effectively adapt to changing climatic conditions and increased risk of extreme weather events further increases the continent’s exposure to climate change (COMESA 2009).

Underpinning the concept of risk is the notion of equilibrium, which has dominated the landscape of development policy. In spite of the emerging acknowledgment of uncertainty and rhetoric about the need of flexible decision-making processes, risk management practices continue to hold sway. Equilibrium thinking continues to frame uncertainty, and as a result, command and control style policies continue to evoke technological solutions as a means to effectively mitigate and adapt to climate change. In short, an overemphasis on short-term fixes grants science and technology a central role in the management and control of climate risk. Technological policies range from the search for improved crops, more irrigation systems and enhanced agricultural inputs to improve climate projections, climate information systems and improved seasonal forecasting.

There is no doubt that technologies have key roles to play in addressing the challenges posed by climate change. Yet driven by conventional equilibrium and modernization thinking (Scoones et al 1996), technological choices in agriculture are still portrayed as existing *outside* politics and scientific and technological advances continue to be key determinants of the mitigation and adaptation paths for agricultural development. However, far from being apolitical, those who have access to the products of scientific and technological research will exert an ever increasing

influence on the decision making process. As seen in section 2, science and technology have been inseparable from the modernization project. The power of expertise and the transfer of technologies continue to underpin agricultural development policies. The framing of uncertainty as lack of information thus provides the policy space for the revival of top-down techno-centric approaches to agricultural policy, rather than localized ones that focus on enhancing adaptive management or dynamic policy planning, as increasingly suggested by others (Scoones et al 2007, Thompson et al 2007)

Neo-liberal approaches to benefit from climate change

Third, a dominant neo-liberal approach to the challenges of climate change brings to the forefront of the policy debate the role of the market as a key mechanism for agricultural policy under the umbrella of climate change. As highlighted in the time-line of the policy process (Section 3), the decline in ODA in agricultural development by the end of the 1980s and through the 1990s, provided the space for private transfers and the role of the private sector in making up for the gaps in public funding. This, coupled with the framing of climate change as an additional challenge⁸ to market development in SSA, provides the policy space for market-based approaches to agricultural development policy.

As seen in section 2, the importance of agricultural markets for consolidating farm production and productivity gains has been debated at length within agricultural development. However, the climate change policy debate brings into the agenda the role of the carbon market – framed as a ‘win-win’ solution as opportunities for agricultural growth and ensures emissions cuts more efficiently than direct government regulation. In other words, carbon offsets are presented as a source of additional income which contributes to raising the welfare of citizens (by increasing purchasing power) and reducing vulnerability (by diversifying income for the poor and producing positive spin-offs for assets) (Landell-Mills and Porras, 2002:100). An example is the protection of arable land and agricultural productivity enhancement through investment in forest protection and management.

Carbon finance represents a new financing source for revegetating drylands, providing alternative sources of energy and making drought-prone areas more resilient to climate change (World Bank 2004)

The 4 dominant narratives view the carbon market economy as being economically efficient and as providing market incentives for a wide range of resources managers. There seems to be a wide agreement in relation to the role of global carbon markets in generating credits through different climate change initiatives including REDD+, CDM or PES. These credits can generate additional income for farmers and improve economic growth (Campbell, 2009). The story line goes on to suggest that climate change provides opportunities for enhanced investment in African agriculture such as REDD+ or CDM, which would be enhanced with the use of markets (CAADP, 2009f). African leaders are calling for inclusion in the global carbon markets and into the Clean

Development Mechanisms of carbon credits for afforestation, reforestation, agroforestry, enhanced natural regeneration, re-vegetation of degraded lands, reduced soil tillage, and sustainable agricultural practices (Deressa, 2010). In SSA, at the regional level, networks for the creation of regional markets are being created. Regional and subregional bodies, along with major donor institutions, are supporting the issue of regional market integration including the African Union, COMESA, SADC and ECOWAS.

Counter-narratives question the positive role of agricultural and carbon markets in growth and poverty reduction. For instance, it is argued that while incentives originating from carbon markets are significant, revenues are unevenly distributed. In addition, it is argued that carbon markets are already eroding local agro-forestry markets which have become essential in local adaptation to climate change (Nkem et al., 2010:498-508). Furthermore, a study of cocoa producers in Ghana suggests that adoption of REDD+ carbon markets in agriculture by small farmers is doubtful if REDD+ means that unless carbon prices are very high and cocoa prices very low (Campbell, 2009: 397). - farmers cannot expand their fields

7. Conclusions

Climate change plays, and has always played, a major role in configuring local livelihoods and national economies in SSA. This research began with the objective of examining how climate change concerns are re-shaping the agricultural development agenda, with the understanding that an examination of contemporary policies called for an analysis of the policy narratives framing the debate in a historical context - situating contemporary discussions alongside antecedent visions. This paper has identified 4 contemporary narratives on agricultural development policies that address climate change, each of which is centred on and each implying a different role of agriculture. Contemporary agriculture development policy is constructed around a series of interweaving narratives about food security and poverty reduction, environmental crisis, economic growth and technology and innovation. Within different epochs, these issues have been given different weight, in addition to being interconnected and coexisted in different ways. Examination of policy documents suggest that dominant narratives continue to hold the assumption that population growth combined with poor practices and lack of technological innovation are contributing to a crisis of environmental management, economic growth and threatens the investments of recent decades of ending poverty. The image of a highly vulnerable region in constant crisis continues to be reinforced under the umbrella of climate change.

The array of actors, initiatives and groupings of actors in the agriculture and climate change sector in Sub-Saharan Africa is immense. It is this organizational complexity – and the associated interests and politics involved – that drives the policy processes associated with climate change and agriculture. Which views prevail and which policies are implemented are dependent on the complex interactions in this mix. A historical analysis

of current narratives has shed light on the persistence of certain assumptions and debates surrounding agriculture and the environment and how these continue to shape current debates in the agricultural sector. Despite the criticisms and counter-narratives that emerged in early 1960s and continue to emerge, many of the assumptions underpinning contemporary policy remain pervasive in the practices and policy debates of contemporary agricultural development policies. It is important to remind ourselves however that actors, their interests and relative power shape that policy. A deeper understanding to current and future policy processes in SSA would require an analysis on the ways in which the relative power of actors involved defines the policy process, who is included and who is excluded and which interest dominate the process.

The international debate on agriculture and climate change in the SSA region, with its deep-rooted positions and generalized narratives is inevitably limited. To quote Keynes: 'the difficulty lies not in new ideas, but escaping from old ones'. Many of the foundations that continue to underpin agricultural development were established in the 1950s – part of a discourse that linked agriculture to underdevelopment. The four dominant narratives identified here are driven by previous assumptions that the region needs to undertake dramatic changes in order to develop its potential and solve its crises, implying a transition towards a modern, sustainable and highly productive agricultural agenda. The research presented in this paper not only highlights the importance of narratives in relation to the policy process of international development actors but also points out the capacity of such narratives to absorb counter-narratives. A closer look at the emergence of narratives reveals a process of hybridization, through which contemporary versions incorporate concepts generated by counter-narratives (i.e participation, indigenous knowledge, pro-poor growth and so on). Put differently, dominant narratives have absorbed the language of counter narratives (participation, pro-poor growth, local knowledge and so on). This process has given rise to recasting elements of older approaches in an 'evocative' climate change story line.

Climate change has become a headline issue in policy statements from donors, governments and civil society actors. In the agricultural sector, most agencies have started re-thinking their agricultural portfolios in relation to the projected climate change impacts. It could be argued that climate change presents a window of opportunity to open up policy spaces for dealing with uncertainty and complexity of agri-food systems. However, findings in this paper suggest that, despite scientific uncertainty and criticisms, current policies on climate change and agriculture tend to stick to a particular set of system framings that have dominated the thinking of sub-Saharan Africa during the 20th century. As a result, there might be risk of not making sufficient space for alternative perspectives and a corresponding risk of flattening out debate around ideas. A historical approach to climate change and agricultural policy-making will be critical to learn from previous mistakes and broaden existing narratives. In this sense, key challenges ahead include recognising not only equilibrium ecosystems but

also the disequibral nature of sub-Saharan African ecosystems. In addition, it will be essential to draw on farmers' constraints to production rather than on generic assumptions on farmers' needs. This implies a shift from downstream to more contextually informed policies that acknowledge the diversity of the environmental, socioeconomic and cultural features of 'rural worlds' in sub-Saharan Africa. Critically thinking of past, present and future agricultures through will be crucial if climate change and agricultural policies are to be ecologically, culturally and socioeconomically sustainable.

End Notes

¹ See: http://www.oecd.org/document/16/0,3343,en_2649_34621_36562128_1_1_1_1,00.html

² President of the International Fund for Agricultural Development (IFAD) at the IPS conference 2008, Oslo.

³ <http://ccaafs.cgiar.org/commission>

⁴ For more information, see: http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php

⁵ UNFCCC, United Nations Framework Convention on Climate Change, FCCC/Informal/84, GE.05-62220 (E) 200705.

⁶ See annex 1 for a detail list of policy documents reviewed.

⁷ Government of Malawi

⁸ - As increased frequency of climate change events such as El Niño does not provide a safe investment environment

8. References

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9. Annexes

Annex 1: Key policy documents on agriculture and climate change

Key Players	References
Bilateral Donors	
DFID	Departmental Adaptation Plan (2010) Climate Proofing Africa. Climate and Africa's development challenge (2005)
SIDA	Africa Policy (2008)
CIDA	Agriculture Policy Statement 2003 Food Security Strategy 2009
IDRC	'Climate Change Adaptation in Africa (CCAA): research and capacity development program. Program Strategy Overview' (2007) http://www.idrc.ca/uploads/user-S/11913329091CCAA_strategy_document.pdf
USAID	'Global Climate Change Program' (2007) http://pdf.usaid.gov/pdf_docs/PDAACL890.pdf
GTZ	Adaptation to African Agriculture to Climate Change (2009)
EU	Advancing African Agriculture. Proposal for continental and regional level cooperation on agricultural development in Africa (2007)
Multi-Donor Platforms	
Global Development Platform on Rural Development (GDPRD)	Policy Brief. Agriculture and Climate Change (2010) Policy Brief: The future of smallholder agriculture (2008) An overview of Agricultural donor coordination structures at country level in Africa (2008) On Common Ground: A Joint Donor Concept on Rural Development (2006)
TerrAfrica	TerrAfrica is a multipartner platform that seeks to provide an enabling framework for action in support of the mission to scale up the mainstreaming and financing of effective and efficient country-driven sustainable land management approaches (SLM). Land and Climate. The role of Sustainable Land management for climate change adaptation and mitigation in Sub-Saharan Africa Regional Sustainable Land Management Strategy note (2005)
UN	
UN-FAO	Policy Brief. Food Security and Agricultural Mitigation in Developing Countries: Options for Capturing Synergies. Climate Change Implications For Food Security And Natural Resources Management In Africa (2010) Enabling Agriculture to contribute to climate change mitigation (2009)
UNECA	Africa Review report on Agriculture and Rural Development. Fifth Meeting of the Africa committee on Sustainable Development (2007) Accelerating Africa's Development through Diversification (2007)
UNDP	UNDP Briefing Note. Adaptation to Climate Change: Doing Development Differently (2008)
UNCTAD	Technology and Innovation Report. Enhancing food security in Africa through science, technology and innovation (2010)
IFAD	IFAD Climate Change Strategy (2010) The Strategic Investment Program for Sustainable Land Management in sub-saharan Africa (2009)
Financial Institutions	
GEF	The Global Environment Facility (2010) http://www.ifad.org/operations/gef/index.htm 'The Global Environment Facility. Financing Climate Change Solutions' (2007) http://www.un.org/climatechange/pdfs/bali/gef-bali07-7.pdf
World Bank	Africa Action plan (2010) Agriculture for Development (2008) Evaluation of Sub-Saharan African Agriculture programmes (2007)
UNFCC	Challenges and opportunities for mitigation in the agricultural sector (2008) Background paper on Impacts, vulnerability and adaptation to climate change in Africa (2006)
Regional/National Institutions	
AU	Draft African Union decision on the African process for combating climate change (2009) http://www.unep.org/roa/Amcen/Amcen_Events/3rd_ss/Docs/African-Union-Decision-Draft.pdf
NEPAD (CAADP)	Implementing CAADP FOR Africa's food security needs: a progress report on selected activities (2010). http://www.caadp.net/pdf/CAADP%20Report%20for%20the%20AU%20July%202010%20Summit.pdf CAADP Review: renewing the commitment to African agriculture (2010) http://www.caadp.net/pdf/CAADP%20Review%20-%20November%202009.pdf

Key Players	References
Research Institutions	
IPC?	'International agricultural food and Trade Policy Council Annual Report' (2009) http://www.agritrade.org/documents/2009_IPC_Annual_Report.pdf
IFPRI?	Discussion Paper. Micro-level Practices to Adapt to Climate Change for African Small-scale Farmers (Below et al. 2010) Climate Change. Impact on Agriculture and Costs of Adaptation (2009)
IFPRI	'The impact of Climate Variability and Climate Change on water and food outcomes' (2007) http://www.ifpri.org/sites/default/files/publications/rb15_01.pdf
Private Donors	
AGRA	'Climate change and adaptation in African agriculture' (2009) http://www.agra-alliance.org
Rockefeller foundation	'How can African agriculture adapt to climate change: insights from Ethiopia and South Africa. The impact of climate variability and climate change on water and Food Outcomes: a Framework for Analysis' (2008) http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/african-agriculture-climate-change

Annex 2: Climate Funds and the Agricultural Sector

Fund (click for overview)	Type	Administered by	Areas of focus	Agriculture link y/n	Projects in Africa y/n
Adaptation Fund	Multilateral	Adaptation Fund Board	Adaptation	n	y
Amazon Fund (Fundo Amazônia)	Multilateral	Brazilian Development Bank (BNDES)	Mitigation - REDD, Adaptation, Mitigation - general	n	n
Clean Technology Fund	Multilateral	The World Bank	Mitigation - general	y	y
Congo Basin Forest Fund	Multilateral	African Development Bank	Mitigation - REDD	n	y
Cool Earth Partnership	Bilateral	Government of Japan	Adaptation, Mitigation - general	n	y
Environmental Transformation Fund - International Window	Bilateral	Government of the United Kingdom	Adaptation, Mitigation - general	y	n
Forest Carbon Partnership Facility	Multilateral	The World Bank	Mitigation - REDD	n	y
Forest Investment Program	Multilateral	The World bank	Mitigation - REDD	n	y
GEF Trust Fund - Climate Change focal area	Multilateral	The Global Environment Facility (GEF)	Adaptation, Mitigation - general	y	y
Global Climate Change Alliance	Multilateral	The European Commission	Mitigation - REDD, Untitled entry (ID: 55287), Untitled entry (ID: 55281), Adaptation, Mitigation - general	n	y
Global Energy Efficiency and Renewable Energy Fund	Multilateral	European Commission	Mitigation - general	n	y
International Climate Initiative	Bilateral	Government of Germany	Adaptation, Mitigation - general	n	y
International Forest Carbon Initiative	Bilateral	Government of Australia	Mitigation - REDD	y	y
Least Developed Countries Fund	Multilateral	The Global Environment Facility (GEF)	Adaptation	y	y
MDG Achievement Fund – Environment and Climate Change thematic window	Multilateral	UNDP	Adaptation, Mitigation - general	y	y
Pilot Program for Climate Resilience	Multilateral	The World Bank	Adaptation	y	y
Scaling-Up Renewable Energy Program for Low Income Countries	Multilateral	The World Bank	Mitigation - general	y	n
Special Climate Change Fund	Multilateral	The Global Environment Facility (GEF)	Adaptation	y	n
Strategic Climate Fund	Multilateral	The World Bank	Mitigation - REDD, Adaptation, Mitigation - general	n	y
Strategic Priority on Adaptation	Multilateral	The Global Environment Facility (GEF)	Adaptation	n	y
UN-REDD Programme	Multilateral	UNDP	Mitigation - REDD	n	y

Source: <http://www.climatefundsupdate.org/listing>

Annex 3: Actors and Instruments in Agriculture and Climate Change policies in Sub-Saharan Africa

Name	Type	Scope	Africa coverage	Type of countries	Key institutional linkages	Climate change - Agriculture	Climate change focus (tick)		Ongoing CC activities	Funding source(s)
							mitigation	adaptation		
<i>name of actor / instrument</i>	<i>e.g. organisation, policy instrument</i>	<i>funding, technical support</i>	<i>e.g. national, regional, country-specific</i>	<i>e.g. LDC focus</i>	<i>e.g. UNFCCC, CGIAR</i>	<i>does it have a clearly articulated aim on CC - agric? y/n</i>			<i>y/n</i>	
AFRICAN UNION	Inter-governmental organisation	general	regional	African countries		n	X	X	y	Public
NEPAD	Policy instrument	general	regional	African countries	African Union	n	X	X	y	Public and Private
CAADP	Wide regional process	general	regional	African countries	African Union	n	X	X	y	Public and Private
ECOWAS	Inter-governmental organisation	general	subregional	West African States		n			n	Public
COMESA	Inter-governmental organisation	general	subregional	Eastern and Southern African countries		y	X	X	y	Public
SADC	Inter-governmental organisation	general	subregional	Southern African Countries		n			n	Public
GAFSP (WB)	Policy instrument	funding	regional	Poor countries' focus	World Bank	y	X	X	n	Public and Private
PPCR (WB)	Policy instrument	funding	national	Mozambique, Niger, Zambia	World Bank	n	X	X	y	Public and Private
GDPRD	Donor Platform	funding	regional	Developing countries		y	X	X	y	Public and Private
Global Environment Facility	Partnership	funding	regional	Developing countries and Economies in transition		n	X	X	y	Public and Private
TerrAfrica	Multi-partner Platform	technical support	regional	African countries	UNCDD	y	X	X	y	Public and Private
Strategic investment Programme	Policy Instrument	technical support	regional	African countries	IFAD	n			n	Public and Private
European Union	Inter-governmental organisation		regional	non-OECD countries		n	X	X	y	Public
Global Climate Change Alliance	Policy instrument	technical support	regional	LDC and SIDS focus	European Union	n	X	X	y	Public

Name	Type	Scope	Africa coverage	Type of countries	Key institutional linkages	Climate change - Agriculture	Climate change focus (tick)		Ongoing CC activities	Funding source(s)
FAO	UN Body	general	regional	Developing countries		y	X	X	y	Public
Africa Adaptation Programme	Policy instrument	capacity building	national	African countries	UNDP, JICA	y		X	y	Public
CC DARE	Policy instrument	technical and financial support	national	Sub-Saharan Countries	UNDP/ UNEP/ DANIDA	y		X	y	Public
UNECA	UN Body	general	regional	African countries		y	X	X	y	Public
Clim-dev Africa	Policy instrument	technical support	regional	African countries	UNECA	y		X	y	Public
UNCTAD	UN Body	knowledge base	regional	Developing countries		n	X		y	Public
IFAD	UN Body	funding	regional	Developing countries		y	X	X	y	Public
DFID	Bilateral donor	general	national	Developing countries		y		X	y	Public
SIDA	Bilateral donor	technical and financial support	national	Developing countries	NEPAD, IFPRI	n	X	X	y	Public
CIDA	Bilateral donor	technical and financial support	national	Developing countries	NEPAD	n				
Pan-African Agricultural Programme	Policy instrument	technical support	regional	African countries	NEPAD, CIDA	n			n	Public
USAID	Bilateral donor	general	national	Developing countries		y	X	X	y	Public
GTZ	Bilateral donor	general	national	Developing countries	CIP, ICRISAT, IFPRI, ILRI, IWMI	y		X	y	Public
AGRA	Private donor	general	regional	African countries	NEPAD	n			n	Private
Ford Foundation	Private donor	funding	regional	Developing countries	IFAD	n		X	y	Private
IPC (International Food & Agricultural Trade Policy Council)	Research Institute	research	regional	Global	AGRA	n			n	Private

Name	Type	Scope	Africa coverage	Type of countries	Key institutional linkages	Climate change - Agriculture	Climate change focus (tick)		Ongoing CC activities	Funding source(s)
IDRC	Corporation	research and funding support	regional	Developing countries		n		X	y	Private
ICRISAT	Research Institute	research	regional	Asia and Sub-Saharan Africa	CGIAR	y		X	y	Private
CGIAR	Consultative group	research	regional	Global		y		X	y	Private
IFPRI	Research Institute	research	regional	Global	CGIAR	n	X	X	y	Private
FARA	Forum	research	regional	African countries		n			n	Private
AFSTA	Trade Association	technical support, research	regional	African countries		n			n	Private
Biochar Energy Corporation	Corporation	research, industry development and communication		Global		n			n	Private
NAPA	Policy Instrument	technical support	country-specific	Non-Annex I Countries	UNFCCC			X	y	Public
NAMA	Policy instrument	technical support	country-specific	Annex and non-Annex I Countries	UNFCCC		X		y	Public
REDD+	Policy instrument	technical support	project	Non-Annex I Countries	UNFCCC		X	X	y	Public/Private
CDM	Policy instrument	technical support	project	non-Annex I Countries	UNFCCC		X		y	Public/Private
WMO	Research Institute	research	regional	Global		y			y	Public

Annex 4: Climate Change and Agricultural policies in Sub-Saharan Africa (by country)

Country	LDC	COMESA	SADC	CAADP status	UNFCCC initial NC	UNFCCC 2nd NC	Government CC strategy	NAPA	NAMA	Copenhagen Accord	CDM agric/ forestry
				http://www.nepad-caadp.net/	http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php	http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php					
Angola	X		X				X				
Benin	X			Signed	X			X	X	X	
Botswana			X		X		X		X	X	
Burkina Faso	X			Signed		X	X	X		X	
Burundi	X	X		Compact signed	X			X			
Cameroon				Focal point appointed	X		X		X		
Cape Verde				Signed	X			X			
Central African Republic	X							X	X	X	
Chad	X							X			
Comoros	X	X		Stocktaking in progress	X			X			
Congo					X	X			X	X	
Côte d'Ivoire					X	X			X	X	
Democratic Republic of the Congo	X	X	X		X	X				X	
Equatorial Guinea	X										
Eritrea	X	X		Government buy-in	X			X	X	X	
Ethiopia	X	X		Signed Compact	X		X	X	X	X	X
Gabon				Starting	X		X		X	X	
Gambia	X			Signed Compact	X		X	X			
Ghana				Signed Compact			X			X	
Guinea	X			Focal point appointed	X			X		X	

Guinea-Bissau	X			Focal point appointed	X			X			
Kenya		X		Signed	X		X				
Lesotho	X		X	Country engagement	X			X		X	
Liberia	X			Compact signed	X		X	X			
Madagascar	X	X	X	Growth options in progress	X			X	X	X	
Malawi	X	X	X	Signed Compact	X			X		X	
Mali	X			Compact signed	X			X		X	
Mauritius			X	Focal point appointed	X		X				
Mozambique	X		X	Focal point appointed	X		X	X			
Namibia			X	Starting			X			X	
Niger	X			Signed Compact	X	X					
Nigeria				Signed Compact	X		X				
Rwanda	X	X		Compact signed	X			X		X	
Sao Tome and Principe	X				X		X	X			
Senegal	X			Signed Compact	X		X	X		X	
Seychelles		X	X	Growth options in progress							
Sierra Leone	X			Signed Compact	X			X	X	X	
Somalia	X				X						
South Africa			X				X		X	X	
Swaziland		X	X	Signed Compact	X		X			X	
Togo	X			Signed Compact	X			X	X		
Uganda	X	X		Signed Compact	X			X			
United Republic of Tanzania	X		X	Signed Compact	X			X		X	
Zambia	X	X	X	Preparing for round table	X			X		X	
Zimbabwe		X	X	Focal point appointed	X						

Annex 5: CAADP implementation status by country:

Source: CAADP (2010)

Annex 6: Agricultural Expenditure by Country compared to CAADP 10%

Source: CAADP, 2010

Annex 7: Agricultural donor coordination structures in Africa

Source: Zewdie (2009)

This **Occasional Paper** was written by **Paula Silva Villanueva** and **Rocio Hiraldo** of the **Future Agricultures Consortium**. The series editor is David Hughes. Further information about this series of Discussion Papers at: www.future-agricultures.org

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