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Review

The Quest for Mainstreaming Climate Change Adaptation into Regional Planning of Least Developed Countries: Strategy Implications for Regions in Ethiopia

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A desk study was conducted during the period 2012/2013 on the quest for Mainstreaming Climate Change Adaptation into Regional Planning of Least Developed Countries. Numerous factors determine vulnerability to climate change in least developed countries (LDCs), including geographical location, gender, age, political affiliation, livelihood, access to resources and wealth (entitlements). Global circulation models predict a 1.7-2.1ºC rise in Ethiopia's mean temperature by 2050. The general objective of the study is to assess the quest for mainstreaming climate change adaptation into regional planning of least developed countries (LDCs) and draw strategy implications for regions in Ethiopia. Comprehensive literature review on climate change vulnerabilities and adaptation measures in least developed countries was conducted in the course of writing this paper. The findings of the study reveal that national adaptation programme of action (NAPAs) in least developed countries were being gender-blind and failed to be properly implemented. Least developed countries should therefore do more to prepare for ongoing and future climate changes focusing on actions that are no-regrets, multi-sectoral and multi-level, and that improve the management of current climate variability. Strengthening capacities to use climate information, enabling locally appropriate responses, screening climate risks, assessing risks and adaptation options, starting with existing policies and plans, broadening constituencies beyond environment agencies, managing strategy conflicts, learning from projects and recognising their limitations, monitoring and learning are the foreseen strategic actions by regions in Ethiopia for effective mainstreaming of climate change adaptation into regional development planning in the years to come.

Keywords: Adaptation, Climate Change, Ethiopia, Least Developed Countries, Mainstreaming, Vulnerability

INTRODUCTION

Regional planning draws on perspectives from the broad fields of economics, geography, town planning and organisational development and integrated regional economic-cum-environmental development plans are expected to show the linkages among economic development, resource use and the production of residuals and impacts on environmental quality and communities (Gabriel and Laugesen, 2000; Batabyal and Nijkamp, 2004; Church, 2010; Krueger, 2010; Mason, 2011). Scholars in regional planning contend that environmental concerns should be properly addressed in regional planning. For instance, Roberts (2006) asserts that the integration of environmental concerns within regional planning aims to reduce the possibility of any dislocation between environmental, economic and spatial processes.

Regional planning usually takes place at both the national and regional levels. According to Gabriel and Laugesen (2000), regional planning from national perspective is concerned with optimizing the use of national space in development process while it is concerned with using regional resources in a way that

maximises the benefits to the economy and population of the region from regional perspective. A country is seen as "a system of regions, each of which constitutes a distinct geographic, socioeconomic, functional or administrative component of national space and each of which comprises a system of settlements and hinterland areas". The regional planner at the national level often concentrates on the interregional implications of patterns of development in the different regions (Gabriel and Laugesen, 2000). Regional planners are much concerned about the sustainable development of a given region. For example, Roberts (2006) contends that regional planners have to persist in pursuit of the goal of sustainable development as their key responsibility is to search for sustainable solutions to the planning of regions. According to Karl and Ranne (2001), the tasks of regional planning include the definition of legally binding goals in the form of regional plans, the co-ordination of the activities of relevant government departments, town and country planning procedures and environmental impact assessments in the case of private and public projects that affect the environment or the surrounding location. They also assert that regional development planning specifies goals both in terms of content and location.

Climate change in this paper refers to a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods (United Nations, 1992; IPCC, 2007). Vulnerability to impacts of climate change in this paper refers to the lack of capacity to adapt and to respond to stress as a result of climate variability or change, with a consequent decline in well-being (Adger et al., 2002; Huq et al., 2003; Brooks et al., 2004; Downing, et al., 2004; IPCC, 2007; Huxtable and Yen, 2009; Yaro et al., 2010; Nelson, 2011; UNPEI, 2011).

Adaptive capacity in this paper refers to the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences (Claire et al., 2002; Adger et al, 2003; Huq et al., 2003; Downing, et al., 2004; Ebi et al., 2004; Brooks et al., 2004; Eriksen et al., 2005; Huxtable and Yen, 2009; Nelson, 2011). Resilience in this paper refers to the ability of a community to resist, absorb, and recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity (Huxtable and Yen, 2009; Nelson, 2011). Hazard in this paper refers to shocks, such as droughts or floods (rapid onset), and to stresses, such as changing rainfall patterns (slow onset) (Huxtable and Yen, 2009).

There are two main ways of responding to climate change: mitigation and adaptation (Adger et al, 2003; Klein et al., 2003; Lim et al., 2004; Lebel et al., 2012). Mitigation may be defined as "an anthropogenic intervention to reduce the anthropogenic forcing of the climate system, which includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks" while adaptation may be defined as "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007). Adaptation to climate change entails adjusting ecological or social systems in response to minimise damages from climate change (Schipper et al., 2010; Lebel et al., 2012).

Mainstreaming climate change adaptation has got scientific and political attention in our current world as effective climate change adaptation approach in Least Developed Countries (LDCs). Mainstreaming climate change adaptation in this paper refers to integrating considerations of climate change adaptation into policy-making, budgeting, implementation and monitoring processes at national, sector and sub-national/regional levels (UNDP-UNEP, 2011 cited in Lebel et al., 2012). The process is seen as on-going, involving multiple stakeholders and contributing to human well-being (Lebel et al., 2012).

Threat of global climate change is one of the most significant scientific and political challenges of our time (Betsill and Bulkeley, 2006). Climate change is expected to increase the frequency and intensity of current hazards and the probability of extreme events, and also to spur the emergence of new hazards and new vulnerabilities with differential spatial and socioeconomic impacts (Revi, 2008). For example, based on the most recent information, mainly from simulations of GCMs, it is believed that the average global temperature of the earth will be between 1.4°C to 5.8°C warmer than it is currently by the end of the 21st century (Jones, et al., 2004). Moreover, there is increasing evidence that the warming of the earth over the past 50 years is attributable to increased greenhouse gases resulting from human activities (Jones, et al., 2004).

As global climate change is unfolding, its effects are being felt disproportionately in the world's poorest countries (Least Developed Countries) and among the groups of people least able to cope. As the world adapts to its evolving climate, more global attention is now being focused on adaptation to the effects of climate change (Kidanu et al., 2009). In other words, there is growing concern about the impacts of climate extreme events (floods, cyclones, droughts, etc.), especially among the least developed countries, given their very limited capacity to adapt and recover from such disasters. Careful analysis of the current situation in light of how climate variability and extremes might change is necessary before informed adaptation activities can be

undertaken. Mainstreaming adaptation to climate change into development planning is being promoted as effective adaptation approach in LDCs and this necessitates careful understanding of vulnerabilities and adaptive capacities of vulnerable communities in LDCs. Hence, this paper proposes to explore the quest for mainstreaming climate change adaptation into Regional Planning in LDCs and draw strategy implications for regions in Ethiopia. The specific objectives of the study are: to explore vulnerabilities to impacts of climate change in LDCs; to appraise climate change adaptation policies and strategies in LDCs; to assess the benefits of mainstreaming climate change adaptation into regional planning; and to identify the role of regional planning in climate change adaptation in LDCs.

The study answered the following key research questions: What are the types of vulnerabilities to impacts of climate change and vulnerable sectors in LDCs? How much effective are climate change adaptation policies and strategies in LDCs? What are the benefits of mainstreaming climate change adaptation into regional planning? What is the role of regional planning in climate change adaptation in LDCs? What are the lessons from a case study on best practices of mainstreaming climate change adaptation into regional planning? What are the strategy implications for regions in Ethiopia on mainstreaming climate change adaptation into regional planning?

RESEARCH METHODOLOGY

A desk or literature review can be a useful way of gathering information about what policies, initiatives, projects, best practices, etc. already exist. Legal, policy, evaluation reports, and media sources were commonly used documents as secondary sources for this study. Accordingly, a comprehensive review and analysis of the existing literature was made in order to obtain both theoretical insights and secondary data on the review and analysis themes. The secondary sources or existing literatures in reference to the review and analysis themes conceptualized in the study were carefully selected and consulted for secondary data collection. In other words, robust secondary sources on the review and analysis themes in the context of least developed countries were identified for the purpose of the study. The Asia Pacific Region was chosen as a case study due to the fact that the selected region has rich experience and best practice in mainstreaming climate change adaptation into regional development planning. Moreover, regions in Ethiopia were purposively selected to propose strategic measures of mainstreaming climate adaptation measures into their regional development planning because of the specific regional negative impacts of climate change and adaptive capacities of communities in Ethiopia. Finally the collected secondary data and information were qualitatively analysed and presented under relevant themes.

DISCUSSION

This section analyses and discusses vulnerabilities to impacts of climate change, Climate change adaptation policies and strategies, the benefits of mainstreaming climate change adaptation into regional planning, the role of regional planning in climate change adaptation, a case study on best practices of mainstreaming climate change adaptation into regional planning in LDCs, and proposed climate change adaptation mainstreaming measures for regions in Ethiopia.

Vulnerabilities to Impacts of Climate Change in Least Developed Countries

Vulnerability to climate change refers to the degree to which groups of people and livelihood systems are susceptible to, and unable to cope with, adverse impacts (Claire et al., 2002; Adger et al, 2003; Huxtable and Yen, 2009; Yaro et al., 2010). Scholars of climate change research contend that the vulnerability of a system includes both an external dimension, represented by its exposure to climate change and variability, and an internal dimension, represented by its sensitivity to these factors and its adaptive capacity (USAID, 2004; Eriksen et al., 2005; Fu¨ssel, 2007; ECE, 2009; Heltberg et al., 2009; Nelson, 2011; UNPEI, 2011). Moreover, some of these scholars assert that it is necessary to distinguish between current and future vulnerability. For example, Tompkins and Adger, 2003; Downing, et al., 2004; Jones, et al., 2004; Malone and Rovere, 2004 claim that current vulnerability relates to current climate variability, independent of future changes in climate, and the ability of the system to cope with this variability. ECE (2009) affirms that assessing current vulnerability provides important insights into the potential responses of the system to future events. Future vulnerability relates to future climate conditions and coping ability under a situation with a changing baseline and more severe and frequent extreme events (Downing, et al., 2004; Jones, et al., 2004; ECE, 2009). There are also scholars who contend that vulnerability has not only physical aspects but also geographical, social, economic, environmental and psychological aspects that need to be taken into account (Tompkins and Adger, 2003; Downing, et al., 2004; Malone and Rovere, 2004; USAID, 2004; Eriksen et al., 2005; Haines et al., 2006; ECE, 2009; Kidanu et al., 2009; Nelson, 2011).

Human vulnerability to disasters in LDCs is a complex phenomenon that includes social, economic, health, and cultural factors. Moreover, vulnerability to natural disasters has two sides: the degree of exposure to dangerous hazards (susceptibility) and the capacity to cope with or recover from the consequences of disasters (resilience) (Keim, 2008; Huxtable and Yen, 2009; Yaro et al., 2010). Vulnerability reduction programs reduce susceptibility and increase resilience (Keim, 2008; Huxtable and Yen, 2009).

According to Schipper et al. (2010), numerous factors determine vulnerability to climate change in LDCs, including geographical location, gender, age, political affiliation, livelihood, access to resources and wealth (entitlements), etc. In other words, vulnerability to climate change is not uniform, but differs according to the socio-cultural axes of a society (Denton, 2002; Downing, et al., 2004; Aalst and Burton, 2008; Huxtable and Yen, 2009; Elasha, 2010; Nelson, 2011; Oates et al., 2011). For instance, social differentiation and access to resources as enabled by both formal and informal institutions accounts for the differential adaptations people face in their communities (Schipper et al., 2010). The nature of the inheritance system, governance systems, and land tenure relations are important in this regard (Schipper et al., 2010; Lebel et al., 2012). Socioeconomic processes lead to the exclusion of some people from mainstream society. For example, climate-enhanced social exclusion is increasing, as evidenced by the increasing number of "environmental refugees" generated by each climate hazard (Mirza, 2003; Keim, 2008; Huxtable and Yen, 2009; Yaro et al., 2010).

Climate change poses a serious challenge to social and economic development (USAID, 2004). Least Developed Countries (LDCs) are particularly vulnerable because their economies are generally more dependent on climate-sensitive natural resources, and because they are less able to cope with the impacts of climate change. Moreover, the effects of climate change may be especially critical to the achievement of development objectives related to the most vulnerable groups and communities in these countries (Elasha, 2010; Nelson, 2011). Thus, the projected impact of climate change on access to natural resources, heat-related mortality and spread of vector-borne diseases such as malaria, for example, has direct implications for the achievement of several of the Millennium Development Goals (Pandey, et al., 2003; Gigli and Agrawala, 2007).

Lebel et al. (2012) claim that the rural poor in less developed countries are vulnerable, as they depend on the productivity of climate-sensitive ecosystems for their livelihoods, including agriculture and fishery while the urban poor are vulnerable to infrastructure and land development decisions that drive settlements into areas that are already exposed to flooding, landslides, and other climate-related disasters, or likely to become so. They also assert that in both realms, poverty hinders access to education, health care and other important services and resources. Additionally, poor countries often lack the knowledge and resources to adequately adapt to growing climate-related risks, building up an "adaptation deficit". Effects on women and children are also disproportionate compared to men in these countries (Mirza, 2003; Kidanu et al., 2009; Elasha, 2010; Nelson, 2011). Moreover, because of gender differences in property rights, access to information and social and economic roles, the effects of climate change will affect men and women differently (Huxtable and Yen, 2009; Elasha, 2010; Nelson, 2011).

Climate Change Adaptation Policies and Strategies in Least Developed Countries

Adaptation to climate change has become an important policy priority in the international negotiations on climate change in recent years. However, it has yet to become a major policy issue within the developing countries, especially amongst the LDCs (who will be amongst the most vulnerable to the adverse impacts of climate change) (Huq et al., 2003). Climate change could significantly undermine development by threatening critical resources, especially water, and increasing the incidence and severity of natural disasters (Huxtable and Yen, 2009; Lebel et al., 2012). More recently, in recognition that some climate impacts are now unavoidable, there has been a growing push for adaptation, in effectively responding to climate change to minimise impacts on both people and ecosystems (IPCC, 2007; Lebel et al., 2012).

One of the results of this growing push for adaptation is National Adaptation Programme of Action (NAPA). NAPA is an adaptation initiative that aims at building the adaptive capacity of the most vulnerable communities in the most vulnerable countries (identified as the Least Developed Countries or LDCs), through the identification and development of specific measures aimed at reducing vulnerabilities to climate change of the different groups and sectors. Based on this, the main objective of the NAPA is to serve as a simplified and direct channel of communication for information related to the urgent and immediate adaptation needs of the LDCs (Elasha, 2010). A set of criteria for selecting priority activities in the NAPAs were (Mirza, 2003, 237): life and livelihood, human health, food security and agriculture, water availability, quality and accessibility, essential infrastructure, cultural heritage, biological diversity, land management, other environmental amenities and other socio-economic factors, especially poverty.

Though there is a good progress resulting from NAPAs

initiatives in some least developed countries, NAPAs are criticized for being gender-blind and failed to be properly implemented. With regard to its gender-blindness, Elasha (2010) contends that none of the National Adaptation Programme of Action (NAPA) projects in LDCs specifically target women development and capacity building in order to improve their contribution to the community's adaptation. Despite this negligence, scholars of climate change research like Nelson (2011) asserts that the impacts of climate change are affecting and will affect disproportionately poorer rural and urban communities in developing countries, but few of the vulnerability and adaptation assessments adequately explore the gendered or socially differentiated nature of those impacts.

To overcome the aforementioned challenges, current climate change adaptation approaches like mainstreaming climate change adaptation encourage participation of stakeholders and gender consideration in the adaptation policy and strategy formulations. The benefit of participating both women and men is that they have distinct and valuable knowledge about how to adapt to the adverse impacts of climate change (Thomasa andTwyman, 2005; Huxtable and Yen, 2009). For example, as primary managers of natural resources and key frontline implementers of development, women in LDCs represent an immense source of potential knowledge and skills to build the adaptive capacity of their communities (Huxtable and Yen, 2009). It is also evident that women play a major role in buffering the family against unexpected climatic shocks. Their knowledge of local people and ecosystems, their skills and abilities, social networks and community organizations help communities mitigate hazardous conditions and events and respond effectively to disasters when they occur (Elasha, 2010). Clearly, there is a gender dimension to adaptive capacity as gender discrimination presents barriers to women's equal participation in many decision-making processes and access to education and skills training (Thomasa andTwyman, 2005; Nelson, 2011).

Lebel et al. (2012) contend that mainstreaming adaptation into development planning in least developed countries (LDCs) has to consider at least national, sectoral and sub-national/regional levels. Climate change adaptation policies need not develop specific and detailed response options, but rather facilitate their development and implementation as part of existing sectoral policies (Heltberg et al., 2009; Lebel et al., 2012). Hardoyand Pandiella (2009) assert that actions that integrate an understanding of the links between environmental problems (including climate change and variability) and development have the greatest potential to generate multiple benefits and provide the kind of measures most needed. They further contend that most of the best adaptation options are those that would be taken even in the absence of climate change because of their contribution to risk reduction and sustainable development.

Political commitment at all levels to participate stakeholders and take gender seriously in combating climate change would make the most difference in achieving fair and gender-equitable finance mechanisms (Thomasa andTwyman, 2005). To build women's participation in national climate change adaptation planning, participatory processes are required that enable diverse groups of disadvantaged women's as well as men's voices to be heard by policy-makers (Adger et al., 2002; Denton, 2002; Bulkeley and Mol, 2003; Brooks et al., 2004; Conde et al., 2004; Ebi et al., 2004; Turnpenny et al., 2005; Few and Tompkins, 2006; Elasha, 2010; Nelson, 2011). There is little point in envisioning future pathways that lead to climate resilience, without seeking gender and social equality: in fact it is surely impossible to achieve resilience without tackling the latter (Nelson, 2011).

Adaptation science and practice have promoted the concept of community-based adaptation, which is locally focused, participatory, and draws on the normative preferences and knowledge of local people (Measham, et al., 2011). As the UNFCCC moves forward with discussions on longer-term adaptation strategies, it should support strategies that foster integrated approaches to strengthening resilience to the effects of climate change (Kidanu et al., 2009). International institutions need to appropriate these latest research insights on adaptation from the developing world and build a global coalition, not only to take action to reduce damaging emissions, but to facilitate the inherent resilience of people coping with an uncertain future(Adger et al., 2002). In many least developed countries climate change adaptation and poverty reduction remain separate strategies and there is a danger that adaptation is being addressed in a fragmented manner. There is a need to build on existing initiatives such as the NAPAs and national (and sectoral) development plans, and to consolidate donor and government efforts, rather than creating new projects or programmes (Oates et al., 2011).

Benefits of Mainstreaming Climate Change Adaptation into Regional Planning of Least Developed Countries

According to UNPEI (2011), mainstreaming climate change adaptation is the iterative process of integrating considerations of climate change adaptation into policy-making, budgeting, implementation and monitoring processes at national, sector and sub-national/regional

levels. In other words, it describes a process of considering climate risks to development projects, and of adjusting project activities and approaches to address these risks (Huxtable and Yen, 2009). It is a multi-year, multi-stakeholder effort grounded in the contribution of climate change adaptation to human well-being, pro-poor economic growth, and achievement of the MDGs (Huxtable and Yen, 2009; UNPEI, 2011). It entails working with a range of government and non-governmental actors, and other actors in the development field (UNPEI, 2011).

Mainstreaming climate risks into the national development agenda reduces the devastating consequences of unanticipated climate-related hazards, including costs that constitute significant drains on national resources, thereby stifling the achievement of set goals (Klein et al., 2003; Jones, et al., 2004; Kok et al., 2008; Yaro et al., 2010). It can also ensure that development programs and policies are not at odds with climate risks both now and in the future (Huxtable and Yen, 2009; Chinvanno, 2011). There is a growing need for policy-makers, particularly in the ministries related to development such as in finance or planning, to better understand how climate change adaptation can be addressed in national and sub-national/regional planning processes, and through fiscal and investment decisions. For example, when making decisions on long-lived infrastructure, it may be more cost-effective to take adaptation needs into account earlier rather than later (Lebel et al., 2012). Mitigation actions tackle the causes of climate change and their benefits are always global while adaptation actions are undertaken at the local or regional level and their benefits are at these levels (Lebel et al., 2012). Gigli and Agrawala (2007) contend that adaptation to the impacts of climate variability and climate change needs to be brought into the mainstream of economic policies, development projects, and international aid efforts. They also assert that the implications of climate variability and change must be considered on a variety of development activities including poverty alleviation, sectoral development, and natural resource management at policy level. While some of the threats from climate change may be new, such as unprecedented climate conditions, many aspects of adaptation build on longstanding efforts, such as to reduce the risk of disaster or protect vulnerable coasts (Füssel, 2007; Lebel et al., 2012; Oates et al., 2011). In other words, adaptation has the potential to align closely with major development objectives.

Mainstreaming climate change adaptation can occur at the strategic level or the operational level (Huxtable and Yen, 2009; Oates et al., 2011). Mainstreaming climate change adaptation at the strategic level addresses the organisational environment in which policies and programmes are developed and implemented. A strategy to integrate climate change concerns into programming must be accompanied by a strategy to ensure that the working environment is sensitive to climate change issues (e.g. consideration of climate related issues in budgets), and sufficient technical capacity and human resources to successfully mainstream climate change adaptation must be made available (Huxtable and Yen, 2009; Oates et al., 2011). Mainstreaming at the operational level involves undertaking an evaluation of risks to poverty reduction activities associated with climate variability and change, and identifying effective, efficient and equitable adaptation measures to reduce those risks and harness opportunities for building adaptive capacity (Huxtable and Yen, 2009; Oates et al., 2011).

In a nut-shell, mainstreaming adaptation into development planning has been promoted as an effective way to respond to climate change and the expected benefits for less developed countries include: avoided policy conflicts; reduced risks and vulnerability; greater efficiency compared with managing adaptation separately; leveraging the much larger financial flows in sectors affected by climate risks than the amounts available for financing adaptation separately, and easier to start with existing policies and practices, rather than creating new ones (Klein et al., 2003; Huxtable and Yen, 2009; King, 2010; Chinvanno, 2011; Oates et al., 2011; UNPEI, 2011;Lebel et al., 2012).

The Role of Regional Planning in Climate Change Adaptation in Least Developed Countries

In recent years much has been written on the subject of vulnerabilities to impacts of climate change and adaptations in least developed countries. But, little has been said about the role of regional planning in adapting to climate variability and change in least developed countries. Planned adaptation to climate change denotes actions undertaken to reduce the risks and capitalize on the opportunities associated with global climate change (Fu¨ssel, 2007). For scholars like Haughton and Counsell (2004) regional planning matters - it is a process fundamental to future place-making activities, providing a forum for deciding what types of future settlement patterns society wishes to see. Regional Planning potentially allows (Gabriel and Laugesen, 2000; Batabyal and Nijkamp, 2004; Church, 2010; Krueger, 2010; Mason, 2011): linkages between sectoral national planning and project planning and between physical and socio-economic and spatial linkages through which project impacts are expressed; the identification of the institutional arrangements necessary to ensure beneficial integration of projects into the economy of a sub-national area; and proper definition of the role that environmental

land use Planning can play in regional development. Regional planning is meant to foster and sustain regional development and its success depends to a great extent upon the effectiveness with which geographic space and spatial relations are incorporated into development planning and management for the region (Gabriel and Laugesen, 2000; Roberts, 2006; Krueger, 2010; Mason, 2011). Moreover, Gabriel and Laugesen (2000) assert that for Regional Planning to full fill its potential to contribute to regional development it should incorporate Environmental Land Use Planning as a fully integral component. Karl and Ranne (2001) contend that promoting environmental gain can both bring about innovative solutions for environmental protection or improvement and help to satisfy social and economic needs which may also help to develop a more positive perception of the interdependencies between environment and development in the regional communities. There is a growing expectation that planning would play a central role in government policy for sustainable development (Albrechts, 2004; Haughton and Counsell, 2004; Williams and Millington, 2004).

For regional planning to play a critical role in climate change adaptation in least developed countries, it should adhere to basic principles and values of sustainable regional planning. Some of the key values include open dialogue, accountability, collaboration, and consensus building (Albrechts, 2004). Certain basic principles for sustainable regional planning includes (Roberts, 2006: 784-785): the desirability of minimizing the number and length of journeys: work, home and leisure activities should become more spatially concentrated; the necessity to reconsider the location of activities, such as retailing, to ensure that they are accessible by transport and located within residential communities; the need to reconsider the mix and location of economic activities and to segregate activities that generate environmental problems in order that they might benefit from collective solutions; the desirability of developing residential forms that accord with the best practice of location, layout and construction in order to achieve maximum efficiency in the use of energy and materials; and the generation of both hard and soft infrastructures that allow for the best use of natural resources, the recycling of waste materials and the substitution of physical movement by other forms of interaction.

Mainstreaming adaptation planning at regional level recognises that vulnerabilities and the capacity to respond are site-specific. Moreover, planning at this level can engage local government, businesses, NGOs and the community (Lebel et al., 2012). Rural and urban development planning will often have a different emphasis. For instance, in rural areas the focus is likely to be on livelihoods, reducing poverty and improving access to public services. Meanwhile, in urban areas, the focus could be on improving infrastructure and building residents' resilience to hazards (UNDP-UNEP, 2011 cited in Lebel et al., 2012).

Most recently there has been a shift towards less emphasis on planning prescription and control in favour of seeing planners' input as one of the many inputs required in the development process, valuing other forms of non-technical knowledge and seeking the involvement of community members in the definition of a common vision (Allen, 2003). In short, planning is seen (and practised) increasingly as an iterative, participatory and flexible process (Allen, 2003). Scholars of regional planning like Measham, et al. (2011) contend that a multiplicity of communities exist, differentiated (and frequently divided) by factors including gender, ethnicity, class, and age in a given region or location. They also assert that this complexity poses multiple challenges for adaptation planning, in terms of what adaptation means for different groups, who benefits and loses from adaptation, and above all, how to define legitimate adaptation options (Measham, et al., 2011).

A common objective of sub-national/regional area-based planning is to reconcile conservation and development objectives, such as supporting nature-based tourism or maintaining other ecosystem goods and services, while still supporting activities such as agriculture, aquaculture or forestry (Lebel et al., 2012). The presence of resilient natural or less-intensively managed ecosystems in the landscape can also be important to people's livelihoods and capacity to adapt. Hence, regional planning has a critical role in climate change adaptation in least developed countries.

A Case study on Best Practices of Mainstreaming Climate Change Adaptation into Regional Development Planning

The author critically reviewed one case study on mainstreaming climate change adaptation into development planning. Accordingly, the analysis report of regional climate change adaptation platform for Asia was critically reviewed to understand challenges and opportunities for mainstreaming adaptation to climate change into development planning in the Asia-Pacific region and draw lessons for other regions in Least Developed Countries (LDCs).

Home to over one billion people, and to 60 per cent of the world's poor (UNESCAP, 2009), the Asia-Pacific region is widely viewed as vulnerable to climate change (ADB 2009a, 2009b; USAID 2010:1; World Bank, ADB, and JICA, 2010 cited in Lebel et al., 2012). Lebel et al. (2012) assert that the rural poor in developing countries are vulnerable, as they depend on the productivity of climate - sensitive ecosystems for their livelihoods,

including agriculture and fishery. They also contend that the urban poor are vulnerable to infrastructure and land development decisions that drive settlements into areas that are already exposed to flooding, landslides, and other climate-related disasters, or likely to become so. In both realms, poverty hinders access to education, health care and other important services and resources. They further affirm that poor countries often lack the knowledge and resources to adequately adapt to growing climate-related risks, building up an “adaptation deficit”. In this context, climate change exacerbates what are already significant challenges, and adds another layer of risk and uncertainty to efforts to achieve sustainable development (Lebel et al., 2012).

Planning processes and capacities vary substantially among countries. Nevertheless, the experiences of national, sub national and sectoral planning initiatives suggest that there are common challenges and opportunities to mainstreaming adaptation to climate change (Lebel et al., 2012). A few of the major lessons learned for development planning from theory and practices in the Asia-Pacific region are: A country or a region should give due attention to the needs and practical experience of practitioners to improve the relevance, accessibility and usefulness of climate information; A country or a region should encourage and support inclusion of local insight and knowledge into national, regional or local climate adaptation policies, strategies and planning; A country or a region should screen regional or local climate risks associated with policies, strategies, plans, programmes and projects to identify the extent to which climate change, risks and vulnerability have been considered or addressed; A country or a region should undertake thorough and well organised climate risk assessments to inform national, regional or local development planning and help to identify and evaluate risks and adaptation options that are specific to the decision or national policy or regional strategy problem; A country or a region should start mainstreaming climate change adaptation with existing policies, plans and institutions, as these often embody important experiences and may already address key development issues; A country or a region should consider climate change as a development issue, rather than an environmental one for proper acknowledgement of the significance of the issue by decision-makers and given an adequate budget, and that responses will be integrated into development planning; A region or a country should properly manage the policy or strategy conflicts in the process of mainstreaming adaptation to climate change not to compromise government’s priority development goals like poverty reduction and other development objectives; A country or a region should learn from climate change policy or strategy and adaptation plans and other policy and planning experiences in its region and recognize their limitations for future improvements; and A country or a region should properly monitor and evaluate climate adaptation projects in its region to check whether they meet their climate adaptation objectives, and what other benefits or adverse impacts they may have on the environment and development.

The Strategy Implications for Mainstreaming Climate Change Adaptation into Regional Development Planning of Regions in Ethiopia

Ethiopia is a country of more than 1.1 million square kilometer, located in the Horn of Africa between approximately 4° and 15° north latitude and 32° and 49° east longitude. Ethiopia’s base of natural resources is the foundation of any economic development, food security and other basic necessities of its people. Smallholder agriculture is the dominant sector that provides over 85 percent of the total employment and foreign exchange earnings and approximately 55 percent of the Gross Domestic Product (GDP). As of recently the industry and service sectors are taking more share of the GDP (EPA, 2012). With more than 80 million inhabitants (2010), Ethiopia is the second-most populous nation in Africa after Nigeria. With an annual population growth of more than 2%, Ethiopia will have more than 120 million people by 2030 (FDRE, 2011; EPA, 2012).

Review of long-term climate data for Ethiopia shows increasing rainfall for some regions and decreasing rainfall for others with temperature rising for all regions (Energy Group of ECSNCC Network, 2011). Global circulation models predict a 1.7-2.1ºC rise in Ethiopia's mean temperature by 2050 (EPA, 2012). Average annual temperatures nationwide are expected to rise 3.1°C by 2060, and 5.1° C by 2090 (Kidanu et al., 2009). In addition, precipitation is projected to decrease from an annual average of 2.04 mm/day (1961-1990) to 1.97 mm/day (2070-2099), for a cumulative decline in rainfall by 25.5 mm/year (Kidanu et al., 2009). This could cause food insecurity, outbreak of diseases such as malaria, dengue fever, cholera and dysentery, malnutrition, land degradation and damage to infrastructure (Kidanu et al., 2009; Adem and Bewket, 2011; Adem and Guta, 20011; Oates et al., 2011 ; EPA, 2012).

The current development plan, GTP, envisages the country’s GDP per capita to grow from 378 USD in 2010 to 1271 USD in 2025. It also projects that the contribution of agriculture will diminish from 42% to 29% indicating migration of jobs from the agriculture sector to industry and services, which are expected to contribute 32% and 39% of the GDP (FDRE, CRGE, 2011). The GTP explicitly recognizes that environment is a vital and important pillar of sustainable development, and states

Box 1. Ethiopia's Climate-Resilient Green Economy (CRGE) Strategy

Ethiopia's Climate-Resilient Green Economy (CRGE) vision and strategy emanated from the Constitution of Ethiopia and the Environmental Policy of Ethiopia approved in 1994 and 1997 respectively.

The CRGE strategy focuses on four pillars that will support Ethiopia's developing green economy respectively:

1. Adoption of agricultural and land use efficiency measures
2. Increased GHG sequestration in forestry, i.e., protecting and re-establishing forests for their economic and ecosystem services including carbon stocks
3. Deployment of renewable and clean power generation
4. Use of appropriate advanced technologies in industry, transport, and buildings

In general four initiatives for fast-track implementation have been selected under the CRGE: (i) exploiting Ethiopia's vast hydropower potential; (ii) large-scale promotion of advanced rural cooking technologies; (iii) efficiency improvements to the livestock value chain; and (iv) Reducing Emissions from Deforestation and Forest Degradation (REDD)

The government has also created institutional arrangements for CRGE strategy implementation. A CRGE facility has been put in place within the Ministry of Finance and Economic Development. The facility is responsible for resources mobilization and disbursement. The EPA shall develop a system for monitoring, reporting and verification. The UNDP, as interim trustee, is responsible to manage the CRGE fund and/ resources. On the other hand, each sector shall have an environmental unit, and are tasked with preparing their respective strategy for resilience *(EPA, 2012)*

that "building a 'Green Economy' and ongoing implementation of environmental laws are among the key strategic directions to be pursued during the plan period" (MoFED, 2010; EPA, 2012). To protect its citizens from such devastating catastrophe and to attain its vision of becoming a middle income country by 2025, the government of Ethiopia has adopted a climate resilient green economy strategy (Box 1).

Adem and Bewket (2011) contend that addressing current and future climate vulnerabilities in development planning and programming through mainstreaming of climate change adaptation should be an immediate priority for Ethiopia. Being prepared to adapt to climate change is important, even as the world strives to reduce the factors that cause it (Adem and Bewket, 2011). Kidanu et al. (2009) claim that including voluntary reproductive health and family planning as a core component of integrated community approaches and strengthening the country's national family planning program will increase the effectiveness of climate change adaptation efforts in Ethiopia. According to Adem and Bewket (2011), development – as - usual, without consideration of climate risks and opportunities, will lead to maladaptive practices weakening national resilience to climate change in Ethiopia.

In a nut-shell, Ethiopia's endeavours (ratification of UNFCCC in 1994 and the Kyoto Protocol in 2005, development and submission of National Adaptation Program of Action (NAPA) in 2007, development and submission of Nationally Appropriate Mitigation Action (NAMA) in 2010, completion of the Ethiopian Program of Adaptation to Climate Change(EPACC), and the development of the framework for Climate Resilient Green Economy (CRGE)) to respond to the impacts of climate change through adaptation and mitigation policy frameworks are highly appreciable (Adem and Bewket, 2011). Nevertheless, the practical implementation of these policy frameworks is impaired by different challenges. Lack of sector-specific, region-specific and context-specific adaptation strategies, inadequate climate information, institutional limitations, lack of resources, a culture of reactive management, limited awareness and knowledge on climate change, limited participation of sectors and sub-national / regional bodies in national

adaptation policy and strategies, and poor linkage between local-level impacts and national-level responses are to mention some (Haines et al., 2006; Adem and Bewket, 2011; Measham, et al., 2011; UNPEI, 2011).

The author would like to propose the following climate change adaptation mainstreaming strategic measures for regions in Ethiopia to overcome the aforementioned challenges: Each region in Ethiopia should give due attention to the needs and practical experience of practitioners to improve the relevance, accessibility and usefulness of climate information; Each region in Ethiopia should encourage and support inclusion of local insight and knowledge into regional or local climate adaptation strategies and planning; Each region in Ethiopia should screen regional or local climate risks associated with strategies, plans, programmes and projects to identify the extent to which climate change, risks and vulnerability have been considered or addressed; Each region in Ethiopia should undertake thorough and well organised climate risk assessments to inform regional or local development planning and help to identify and evaluate risks and adaptation options that are specific to the decision or regional strategy problem; Each region in Ethiopia should start mainstreaming climate change adaptation with existing policies, plans and institutions, as these often embody important experiences and may already address key development issues; Each region in Ethiopia should consider climate change as development issue, rather than an environmental one to acknowledge its significance by decision-makers and given an adequate budget, and that responses will be integrated into development planning; Each region in Ethiopia should properly manage the strategy conflicts in the process of mainstreaming adaptation to climate change not to compromise regional government's priority development goals like poverty reduction and other development objectives; Each region in Ethiopia should learn from climate change strategy and adaptation plans and other policy and planning experiences in its region and recognize their limitations for future improvements; and Each region in Ethiopia should properly monitor and evaluate climate adaptation projects in its region to check whether they meet their climate adaptation objectives, and what other benefits or adverse impacts they may have on the environment and development.

CONCLUSION

This study explored the quest for mainstreaming climate change adaptation into regional planning of least developed countries and proposed strategic measures for mainstreaming climate change adaptation into regional development planning of regions in Ethiopia. Mainstreaming adaptation into development planning has been promoted as an effective way to respond to climate change and the expected benefits for least developed countries include: avoided policy conflicts; reduced risks and vulnerability; greater efficiency compared with managing adaptation separately; leveraging the much larger financial flows in sectors affected by climate risks than the amounts available for financing adaptation separately, and easier to start with existing policies and practices, rather than creating new ones. Least developed countries should therefore do more to prepare for ongoing and future climate changes focusing on actions that are no-regrets, multi-sectoral and multi-level, and that improve the management of current climate variability.

Strengthening capacities to use climate information, enabling locally appropriate responses, screening climate risks, assessing risks and adaptation options, starting with existing policies and plans, broadening constituencies beyond environment agencies, managing strategy conflicts, learning from projects and recognising their limitations, monitoring and learning are the foreseen strategic actions by regions in Ethiopia for effective mainstreaming of climate change adaptation into regional development planning in the years to come.

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