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# Approaches and Practices of Mainstreaming Climate Change Adaptation and Mitigation Issues into Development Planning in Ethiopia

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## Abstract

Mitigation issues into development planning.. The critique is to delivers and makes available a comprehensive review, and quests the relationship between climate change adaptation and development. The adjacent associations between climate change adaptation and development. The leading aims of this review is to evaluate different related articles concerning Approaches and practices of mainstreaming climate change adaptation have led to pleas for speak to the two concerns in a cohesive approach. 'Mainstreaming' climate change evidence, policies and measures into continuing development planning and policymaking has been projected as unique solution, assembling a additional sustainable, effective and efficient use of natural resources than scheming and handling climate policies distinctly from enduring actions. Moreover the paper initiates by assembling the circumstance for climate mainstreaming, by reconnoitering ties between adaptation and development .And it reflects by what technique gears mainstreaming in run-through, review. Examining different framework against the surfeit of mainstreaming involvements in Ethiopia, and the framework can be jumble-sale as a apparatus to evaluate advancement on mainstreaming in Ethiopia. The paper accomplishes that while the framework is beneficial for seeing some of the prerequisites compulsory for mainstreaming, practices in Ethiopia shows a plentiful multifaceted makeshift of progressions and backers that basic to be engaged hooked on deliberation in more research works concerning means riming concepts .

**Keywords:** Climate change; mainstreaming; adaptation; Planning, development; Ethiopia

**Abbreviations:** IPCC: Intergovernmental Panel on Climate Change; FDRE: Federal Democratic Republic of Ethiopia; UNDP: United Nations Development Program; NAPA: National Adaptation Program Action; NGO: Non-Governmental Organization; MDGs: Millenium Development Goals; UNFCCC: United nations Framework on Climate Change Convection; GDP: Growth Domestic Product

## Introduction

Climate change has become one of the main problems threatening sustainable development in the world. African countries particularly Ethiopia is one of the poorest and least developed nations in the world. It is also seen as one of the most vulnerable to the impacts of climate change, with limited capacity to cope with short-term climatic shocks or adapt to longer-term trends. Although Ethiopia's economy is longer predominantly 'agricultural-based' in terms of agriculture's contribution to Growth domestic product and exports .agriculture remains Ethiopia's principle source of employment. The sector supports an estimated 85% of the

population and is central to the livelihoods of the rural poor. It remains, however, highly sensitive to temporal and spatial variations in precipitation, partly because of the dominance of rain-fed agriculture, with negative implications for both national food security and poverty reduction efforts [1].

Mainstreaming adaptation into development planning has been endorsed as an actual way to reply to climate change. The anticipated remunerations include avoided policy conflicts, reduced risks and vulnerability, greater efficiency compared with managing adaptation separately, and leveraging the much larger financial flows in sectors

affected by climate risks than the amounts available for financing adaptation separately. It concentrates on the incorporation of climate change adaptation objectives into sectoral policies and plans. It is distinct from a dedicated adaptation approach, which involves policies or programs designed to achieve adaptation objectives as a core function. At a least, mainstreaming requires an assessment of climate information and the risks posed to sectorial objectives and identification of strategies to moderate and reduce those risks [2]. It can also imply adjustments to sectorial objectives and activities to reduce vulnerability and increase efforts to build adaptive capacity. Adaptation to climate change has been 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 [3].

In theory, mainstreaming should create ‘no regrets’ opportunities for achieving development that is resilient to current and future climate impacts for the most vulnerable, and avoid potential tradeoffs between adaptation and development strategies that could result in maladaptation in the future. It involves the integration of information, policies and measures to address climate change into ongoing development planning and decision-making [4]. Ethiopian government plans to move action on climate change adaptation forward by developing and implementing this National Adaptation Plan, in an effort to bring about transformational change in the country’s capacity to address the impacts of climate change. The current efforts to develop this National Adaptation Plan are in compliance with Ethiopia’ obligations under the Cancun Adaptation Framework. The Framework recommended that countries formulate a NAP as a means of identifying medium and long-term adaptation needs and strategies, and mandate institutional responsibility for the effective implementation strategies and programs to address those needs.

Hence, this review paper intended to investigate Approaches and practices of mainstreaming climate change adaptation and mitigation issues into development planning. Therefore, objectives this review were.

a. To review approaches of mainstreaming climate change adaptation and mitigation issues into development planning in Ethiopia.

b. To review practices being used towards mainstreaming climate change mitigation issues into development planning in Ethiopia through in-depth review.

### Basic Concepts of Mainstreaming Climate Change Adaptation and Mitigation Issues into Development Planning

There are two main ways of responding to climate change: mitigation and adaptation. Mitigation 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. Adaptation is the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” [3].

Assimilating or Integrating adaptation into development is often referred to as ‘mainstreaming’. In general terms, mainstreaming refers to integrating an issue into existing (usually development) institutions and decision-making. Mainstreaming adaptation into development planning has been promoted as an effective way to respond to climate change. The expected benefits include avoided policy conflicts, reduced risks and vulnerability, greater efficiency compared with managing adaptation separately, and leveraging the much larger financial flows in sectors affected by climate risks than the amounts available for financing adaptation separately.’ [5].

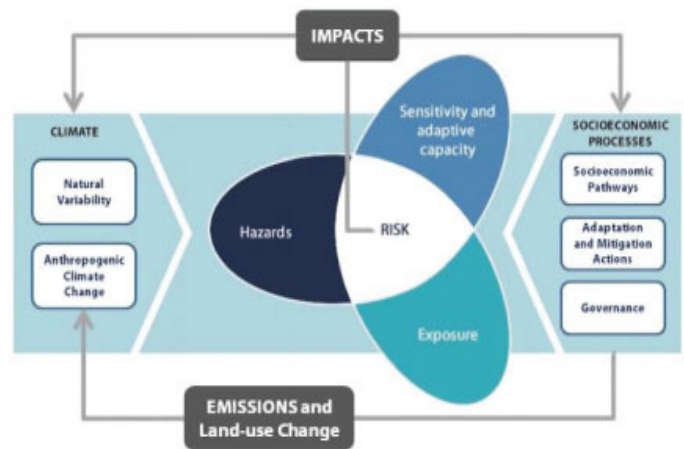


Figure 1: Climate change impacts and adaptation principles (modified from IPCC2014).

### Mainstreaming Climate Change Adaptation in Development Planning

Mainstreaming climate change adaptation is the iterative process of assimilating deliberations of climate change adaptation into policy-making, planning, implementation and monitoring processes at national, sector and subnational levels. 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 Millennium Development

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Goals (MDGs). It entails working with a range of government and non-governmental actors, and other actors in the development field. The approaches on the overall poverty-environment mainstreaming framework presented in the publication *Mainstreaming Poverty-Environment Linkages into Development Planning* [6].

### **The Relationship between Adaptation and Development**

Factually, climate change adaptation and development have been managed in different arenas. Climate change adaptation emerged as a response to climate change impacts as governed under the United Nations Framework Convention on Climate Change (UNFCCC). The ‘ultimate objective’ of the UNFCCC is the mitigation of greenhouse gas emissions to prevent ‘dangerous’ climate change. Thus, adaptation emerged under global governance structures from discussions of climate change impacts and how they could be managed. This has developed into an ‘impacts based’ approach to adaptation [7]. Conversely, researchers and practitioners from development and disaster risk reduction fields have repeatedly pointed out that such ‘stand-alone’ approaches to adaptation targeting very specific climate risks, are unlikely to be effective where they do not also address the underlying factors related to development that make people vulnerable [8].

The developed community applied thinking to climate change adaptation as early as 1987, when the Brundtland Report cited climate change as a major environmental challenge facing development [9]. Adaptation would need to reduce this deficit to increase people’s resilience to climatic variation more generally, before they can adapt to future changes. Such insights have led some scholars to conclude that much adaptation simply represents practical means of achieving sustainable development. This has given rise to recommendations to support sustainable livelihoods, improve governance and make institutions more accountable and participatory as part of adaptation support [4]. The relationship between adaptation and development also works in the other direction: climate change poses a direct threat to the sustainability of development investments. The World Bank estimates that up to 40% of development financed by overseas assistance and concessional loans is sensitive to climatic risk. This not only challenges poverty reduction strategies over the medium term, but also consequently undermines the capacity of the poorest people to adapt [10].

Thus, under climate change, the ‘adaptation deficit’ will be exacerbated. Finally, failing to take adaptation into account in development practice can result in maladaptation, where actions or investments create further risks for adaptation.

The five key dimensions of maladaptation, including actions that increase greenhouse gas emissions; disproportionately burden the most vulnerable; have high opportunity costs; reduce long-term incentives to adapt; and create path dependency. Thus, at least in principle, development and adaptation are now recognized as co-dependent [3]. As adaptation gained prominence under the UNFCCC, its context has shifted from being tied into discussions over impacts and thresholds towards explicit recognition of the role of development in managing adaptation in the scientific and policy guidance emerging from the Intergovernmental Panel on Climate Change (IPCC) and UNFCCC [11].

In the development context, donor agencies are increasingly seeking to ‘climate-proof’ their investments and make them relevant to the building of adaptive capacity [12]. A review undertaken of interventions labelled as ‘adaptation’ found that in practice, adaptation and development are not implemented as discreet interventions, but instead lie along a continuum between those that overlap almost completely with development, and those focused specifically on climate impacts. Accordingly, there is broad agreement within both the climate and development community that an integrated approach to doing adaptation and development makes sense.

### **Adopting Adaptation and development through Mainstreaming approach**

More recently, ‘environmental mainstreaming’ entered the development policy agenda. This is defined as the informed inclusion of relevant environmental concerns into institutional decisions that drive national and sectoral development policy, rules, plans, investment and action. Mainstreaming, or ensuring integrated policy-making, therefore has a long history in both development and environmental policy. Applied to climate change adaptation, mainstreaming has been proposed as a key avenue through which to address adaptation and development together.

Mainstreaming can be viewed in to two perspectives, technology based and development based view of adaptation. In the technology-based view, mainstreaming largely refers to ensuring that projections of climate impacts are considered in decision-making about investments, so technologies (e.g. drainage systems or crop varieties) are chosen or improved to withstand the future climate. This type of mainstreaming has also been referred to as ‘climate-proofing’ or ‘mainstreaming minimum and can involve screening of development portfolios through a climate-change lens. A ‘climate-proofing’ only approach to mainstreaming has been widely criticized for failing to fully address the underlying drivers of vulnerability; not

addressing maladaptation; and not realizing the potential of development interventions to achieve climate resilience. For example, strengthening an embankment to ensure that it can withstand anticipated increases in storm surges will not protect those who cannot afford to reside behind it, and may inadvertently encourage investment and settlement in a climate-vulnerable area’.

On the other way, development-based view of adaptation gives rise to a more holistic approach, in which in addition to climate-proofing, development efforts deliberately aim to reduce vulnerability by including priorities essential for adaptation. It provides the example of securing water rights for groups exposed to water scarcity during a drought. This latter option takes adaptation responses not as stand-alone or discrete options, but as support to a range of processes that address the underlying drivers of vulnerability. Mainstreaming- plus or ‘adaptation as development’. It recognizes that adaptation involves many actors, requires an enabling environment with existing financial, legal, institutional, and knowledge barriers to adaptation removed, and involves strengthening capacity of people and organizations to adapt [13].

Climate-proofing agriculture, water resources, infrastructure and transport sector projects in Ethiopia incorporating adaptation and mitigation components in relevant development projects and providing technical assistance for climate-resilient development. International and national NGOs have also played a key role in mainstreaming, including providing information and pilot projects which feed lessons into broader government processes. But, only focusing on mainstreaming adaptation into external development assistance does not necessarily take into account the corresponding changes required in the wider national and local institutional environments to ensure that investments are sustainable. The national level provides the overall framework within which sectoral and other sub-national levels operate, and where policy goals from long-term strategies are translated into action plans and budgets [14].

#### A charter for climate change Mainstreaming in Ethiopia

The need for developing countries like Ethiopia, to mainstream climate change adaptation into development planning is reflected in various avenues under the UNFCCC. Guidance for the development of National Adaptation Programmed of Action (NAPAs) under the UNFCCC states that NAPAs should be ‘mainstreamed’ international development planning processes. Numerous guidance exists on ‘how to mainstream’ adaptation into development, but these are

generally targeted ‘how-to’ guides aimed at development professionals [15]. Some early guidance was developed for mainstreaming NAPAs into development planning, but this was annexed in the overall NAPA development guidelines, and given limited funds for NAPA preparation, many countries did not have the resources or incentives to ensure an integrated approach to NAPA development [16].

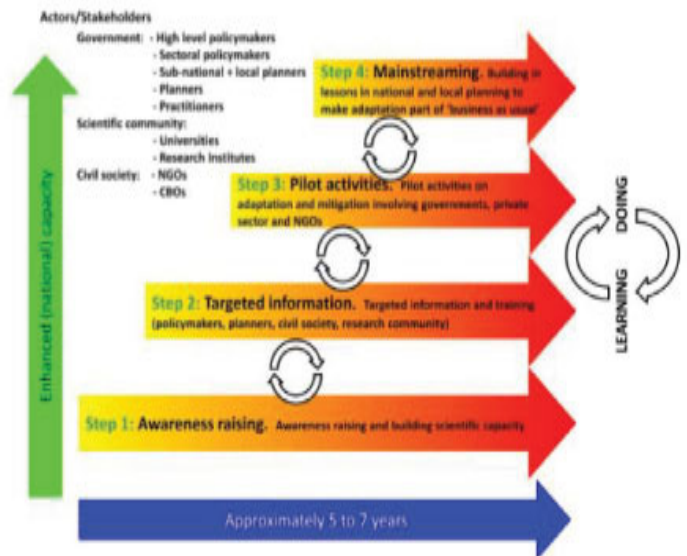


Figure 2: Steps to building national capacity on climate change adaptation for mainstreaming.

The framework proposes a linear sequence of awareness and scientific capacity-building, targeted information and training of key stakeholders, which is followed up with pilot studies to inform policy-makers and generate incentives to incorporate lessons learnt into policy and planning [14]. Step one describes awareness-raising on the relevance of climate change adaptation for development. This is the first step in any group of decision-makers adopting adaptation as a priority issue. If adaptation is to be integrated into planning in a sustainable way, demand needs to come from policy planners and implementers themselves, requiring decision-makers to recognize adaptation as not only applicable, but, in some cases, urgent. The authors argue that critical to getting adaptation to be taken up by policy-makers is the generation of scientific evidence to support decision-making. Simply highlighting ‘problems’ is not useful for policy-making; evidence generated needs to demonstrate relevant, realistic, solutions.

Step two describes how this information is made available to decision-makers across sectors and scales. First, there needs to be enough interest from decision-makers to demand and be receptive to climate vulnerability information. Second, information needs to be presented in



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a useable form, and capacity needs to be built to enable its use. Civil society plays a key 'boundary organization' role in translating scientific information into usable policy advice. Step three describes the initial types of climate change adaptation responses, which tend to be isolated pilots and projected interventions, often undertaken by NGOs. There has been criticism of the ways projected adaptation approaches fail to lead to long-term resilience-building in a projected approach, adaptation is automatically taken as an objective or outcome, rather than as a process. Adaptation as a 'process' involves building adaptive capacity by creating enabling conditions for adaptive activities to take place. Nevertheless, this step has proved important for countries to learn about what adaptation might 'look like', to inform mainstreaming and build capacity [17].

Step four involves full integration of climate change adaptation into policy and planning across different sectors and scales, requiring a shift from 'business as usual' to investment and planning that is not only climate-proof, but also explicitly seeks to build resilience amongst the climate-vulnerable poor. It is this stage where Government stakeholders become fully engaged in adaptation planning. Critically, this means not just environment agencies, but planning and finance ministries who can drive integration of climate change adaptation priorities into broader development priorities.

#### **Principles and considerations for Mainstreaming Climate Risk into National SP Frameworks**

Mainstreaming climate risk onto development refers to the process of integrating climate concerns into existing policy and institutional frameworks and decision-making mechanisms. In the context of climate change adaptation (CCA), mainstreaming is a multi-level process. Which necessitates a holistic and integrated approach oriented towards reducing the underlying factors of vulnerability along with climate-proofing projects and programmes (Hussain,2014) Drawing upon this conceptualization, a number of design principles and considerations for mainstreaming climate change risk into national social protection frameworks in developing countries, particularly Ethiopia are proposed as follows.

#### **Evaluate and acknowledge climate-related risks and uncertainties to create a long-term strategic outlook**

Climate-aware social protection planning entails incorporating climate risk and uncertainty into decision-making. SP can result in maladaptation when the long-term impacts of climate change like sea level rise and land degradation are not considered in the design and planning phases. For instance, while SP measures targeting people

living in disaster-prone areas like cash transfers and crop insurance can reduce communities' short-term vulnerability to climate variability and extremes, in some cases they create an incentive to stay and invest in locations threatened by a long-term environmental degradation, whereas other adaptation options could be more appropriate. Therefore, it is imperative for social protection strategies to address not only the impact of discrete climate events but also the risks related with a long-term change like slow onset climate events. The latter are generally characterized with a greater uncertainty compared to rapid onset hazards since they are generated over lengthy time periods signifying more complex interaction between various layers of exposure and vulnerability at different spatial and temporal scales [18].

Improved risk assessment and hydro-meteorological forecasting systems can enable the implementation of innovative SP measures such as micro- and meso-level index-based insurance and forecast-based financing. a framework for integrating forecast based financing mechanisms with SP systems – a novel approach to risk mitigation, which has the potential to advance the effectiveness of traditional early warning systems and post disaster humanitarian responses. Anticipatory SP actions like public works to strengthen critical infrastructure or unconditional cash transfers to support evacuation of people prior to a forecasted climate extreme event, can be an active strategy to avoid losses [19].

#### **Establish social protection systems that facilitate both incremental and transformational adaptation**

Most social protection activities could be linked to incremental adaptation as they aim to maintain a certain level of protection and prevention against climate change and extremes, and to build adaptive capacity. But would this be enough in a long-term? In some locations, for example, climate changes will likely lead to a fundamental changes in the state of the affected socio-economic and environmental systems. Under this scenario, when the limits of incremental adaptation are reached, responses must shift from supporting those at risk towards building 'less risky futures' [20].

The concept of transformative social protection, which to date has been premised on promoting social equity, should be viewed from a broader perspective. For instance, livelihood development initiatives might require transformative solutions that go beyond the promotion of minority rights, towards major shifts in livelihood strategies, behavior and institutional change. For example, evidence shows that conditional cash transfers over a promising approach to encourage health preventive behavior that can

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have a long-term positive effect on households' resilience to the impacts of climate change on human health. Also, people who experience loss of traditional livelihood activities and lifestyle because of fundamentally altered environment or forced relocation will need social support to learn new skills, establish new social relations and find new economic opportunities. Institutional transformation and new governance models that bring together diverse actors might be needed to deliver social protection and climate change adaptation objectives. Social protection policies therefore need to be adapted, or ultimately, innovative paths need to be explored [21].

#### **Expedite a just changeover to a green economy**

Green growth development pathways address environmental degradation and climate change and promote intergenerational sustainability and equity. Green policies could create new economic and employment opportunities that can benefit the poor in a long term if SP programmers such as skills development are climate-proofed. Still, environmental policies can have a negative social impact, particularly on people whose livelihoods are dependent on carbon-intensive and unsustainable practices. Green policies could have a significant negative impact on those currently poor, which in turn could undermine the effectiveness of growth to reduce poverty, unless the social costs of green growth are robustly considered. In particular, he distinguishes three channels through which the transition to a green economy can affect the currently poor: (i) environmental pricing and regulations (through price rises, reduced access to resources and basic services, and unemployment); (ii) low carbon and environmentally sensitive investments (e.g. reduced public expenditures for other pro-poor measures); and (iii) climate change adaptation (CCA) measures and climate resilient investments, which could limit the income-generation opportunities especially in marginal areas. In future, as developing countries implement their Nationally Determined Contributions (NDCs), more and more households will be affected by these processes. Therefore, the negative impacts of climate change-related policies on the poor and marginalized people can be considered losses associated with climate change [22].

Social protection has been increasingly seen as an instrument to support a just transition to a green growth by protecting vulnerable groups and combating poverty and social inequality. Some emerging markets like China and Brazil have already realized the need of integrating their pro-climate reforms with SP in the form of unemployment benefits, social transfer programmes and trainings for people affected by environmental regulations imposed

on the forestry, agriculture and energy sectors [23]. In the African context, for example, promoting green livelihoods and jobs in cities can be achieved through local, asset-based, people centered programmes such as household-scale renewable energy generation, urban agriculture, and organic waste management. In this context, state SP policies can be designed to support vulnerable groups through: (i) small-scale green development initiatives aimed at creating employment and business opportunities, and improving livelihood; and (ii) social support and assistance programmes designed to address the risks emerging from new environmental policies and regulations, e.g. by climate proofing targeting mechanisms and developing suitable instruments [24].

#### **Familiarizing Elements of an Approach for Mainstreaming Climate Change Adaptation**

The poverty environment mainstreaming approach set out in Mainstreaming Poverty Environment Linkages into Development Planning: The approach can be revised and used as a framework for adaptation mainstreaming, building on climate-related information, work and processes such as national communications and NAPAs: A Manual for Practitioners provides a starting point to help countries successfully mainstream climate change adaptation into development planning processes, as illustrated by preceding figure [25]. The approach can be revised and used as a framework for adaptation mainstreaming, building on climate-related information, work and processes such as national communications and NAPA. Finding the entry points and making the case is concerned with setting the stage for mainstreaming. Adaptation-specific activities include understanding the linkages between climate change, development and poverty as well as the governmental, political and institutional contexts relevant to adaptation (e.g. climate policies, plans and programmes; current level of mainstreaming; roles and mandates; coordination mechanisms). Adaptation mainstreaming also requires specific awareness raising and partnerships, in particular among climate specialists, planners and financiers.

Mainstreaming into policy processes focuses on integrating issues into an ongoing policy process, based on country-specific evidence. Complementary to country-specific evidence developed as part of a poverty-environment mainstreaming effort are, for example, impact, vulnerability and adaptation assessments; socio-economic analysis of the costs and benefits of adaptation options; and the lessons drawn from adaptation demonstration projects. Based on this evidence, policy documents and measures need to be analysed in light of climate change, be climate-

proofed and include additional priority interventions as appropriate. Meeting the implementation challenge aims at ensuring mainstreaming into budgeting and financing, implementation and monitoring. Adaptation mainstreaming requires investing in climate change monitoring and forecasting (both science and policy related) as part of broader national monitoring efforts. Budgeting and financing adaptation means both integrating adaptation into national systems and leveraging special funding sources and modalities. Policy measures at different levels include both general measures revisited with a climate lens and adaptation-specific measures. Institutional and capacity strengthening for adaptation focuses on making mainstreaming a standard government practice (e.g. through mandates, institutional arrangements, procedures, systems and tools).

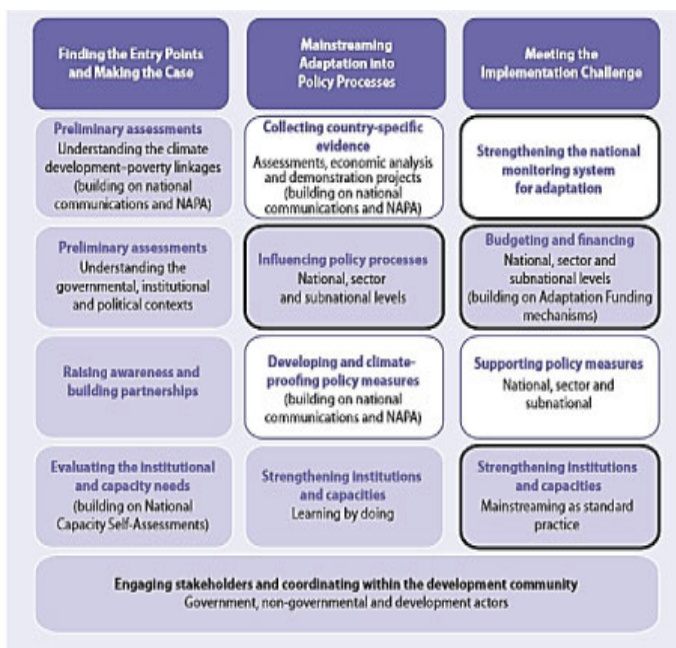


Figure 3: A Programmatic Approach to Mainstreaming Climate Change Adaptation.

### The necessity for mainstreaming adaptation into development in Ethiopia context

Ethiopia is frequently cited as one of the most vulnerable countries to climate change, because its geography makes it physically exposed to climatic hazards and also because of the socio-economic factors that make people vulnerable. Social vulnerability often drives physical exposure, which in turn can exacerbate social vulnerabilities. Many of the projected impacts of climate change are expected to exacerbate these existing environmental hazards: increasing intensity of cyclones and extreme events; exacerbating flooding and salinity intrusion. The development characteristics of Ethiopia make it particularly vulnerable and limit adaptive

capacity. Furthermore, Ethiopia is particularly vulnerable due to dependency on agriculture. one-thirds of the population is engaged in farming. The combination of physical and social vulnerability means that in Ethiopia, climate change adaptation and development must be tackled together. Managing physical climate hazards without also addressing factors related to under development means that people would remain vulnerable. Only addressing development without taking into account existing and anticipated climate hazards means that development interventions are likely to prove unsustainable and possibly maladaptive in the long term.

### Progress towards mainstreaming climate change in Ethiopia

Ethiopia has approached adaptation mainstreaming both from a climate change perspective, through development of climate change specific plans, programs and institutions that address developmental aspects of vulnerability, and also from a development perspective, integrating climate risk into development programs and policies to help build broader cross-sectoral resilience. The NAPA is generally well regarded; it has faced condemnation for adopting a relatively 'stand-alone' approach to adaptation through targeted climate change adaptation projects. Further, the process was developed in response to international policy and financial incentives under the UNFCCC, rather than being a product of national political will [26].

The National Capacity Self-Assessment (NCSA) for implementing the provisions of multilateral agreements, including the UNFCCC, was hurried, and capacity-building for climate change received high priority. The Capacity Development Action Plan of NCSA identified a package of actions for climate change, including capacity-building of relevant ministries and agencies for adaptation and mitigation. The ECCSAP is a 'pro-poor' climate change management strategy which prioritizes adaptation and disaster risk reduction, and also addresses low carbon development, mitigation, technology transfer and mobilization of international finance. The ECCSAP has the following pillars. (i) Food security, social protection and health, (ii) Comprehensive disaster management, (iii) Infrastructure, (iv) Research and knowledge management, (v) Mitigation and low carbon development, (vi) Capacity-building and institutional strengthening.

Climate change adaptation is also being integrated into general development planning and the National Perspective Plan set the development targets for Ethiopia. The development scenario where citizens will have a higher standard of living, with better education, improved social



justice, a more equitable socio-economic environment; and sustainability of development will be ensured through better protection from climate change and natural disasters. The National Planning Commission is integrating climate change into the Annual Development Programme, which involves mainstreaming climate change in a number of projects in four sectors: agriculture, transport, rural development and water.

Climate change has also been integrated across relevant sectors in Ethiopia. In agriculture, climate risks are highlighted in agricultural planning documents including the National Agricultural Policy (2010). Ethiopia also leads the way on agricultural research programmes related to drought and saline-tolerant rice varieties, seen as key adaptation options. Recommendations from the World Bank on the impacts of climate change have been incorporated into coastal zone management programmes, in the preparation of disaster preparedness plans in water sector plan. Climate change is recognized by the National Water Management Plan as one of the factors determining future water management. Many of the Plan priorities are synergistic with adaptation, such as the recommendation for early warning and flood-proofing systems [27].

**Incorporating climate change adaptation into development policies and strategies in Ethiopia**

It is extremely important for climate change adaptations to be proactively incorporated into development policies and strategies. Macroeconomic and sectoral policies and strategies, which are currently in force, as well as Regional strategies, should be revised or updated regularly and at least as necessary to ensure that they incorporate climate change adaptations appropriately and effectively. Future development policies and strategies should also anticipate

the need to incorporate climate change adaptation appropriately and effectively on regular basis. Ethiopia has made a good effort to undertake some preliminary work to incorporate climate change adaptation into development policies and strategies in general, under the climate resilient green economy (CRGE) strategy and the GTP- II, in particular [28].

**Mainstreaming climate change adaptation in Ethiopia’s water sector policies**

A mainstreaming or ‘development-first’ approach to climate change adaptation seems appropriate for Ethiopia’s water sector. First, it has been argued that effective water management is fundamental to mitigate the impacts of climate change, as water is the primary medium through which these changes will be experienced [29]. Second, Ethiopia’s current water sector policies and strategies have the potential to address these climate risks. For example, objectives of the national ‘general water resources management policy’ include: ‘Managing and combating drought as well as other associated slow-onset disasters through, inter alia, efficient allocation, redistribution, transfer, storage and efficient use of water resources’ and ‘Combating and regulating floods through sustainable mitigation, prevention, rehabilitation and other practical measures’ [30].

Third, Ethiopia’s water sector is still relatively underdeveloped, which can be seen as both a cause and effect of vulnerability to climate variability and change. There are many opportunities to reduce vulnerability simply by investing in the development of infrastructure and institutions for water management [29]. Lastly, there is a need to tackle the underlying socioeconomic causes of vulnerability to water-related climate hazards and to ‘climate proof’ developments to cope with current climate variability, regardless of future change.

In Ethiopia there are initial signs of progress in addressing climate risks and adapting to climate change in the water sector. The MoWE is in the preliminary stages of developing a sector strategy to mainstream adaptation and mitigation into its projects and programmes. There has also been a shift towards an integrated approach to water management, which could help to incorporate adaptation needs into development planning. More generally, there is a relatively high level of awareness of, and interest in, climate change issues within the Ethiopian government as a result of the Prime Minister’s involvement in international negotiations as the African Union’s representative [31]. There are, however, several factors that hinder the mainstreaming process. Whilst historic climatic trends inform Ethiopia’s

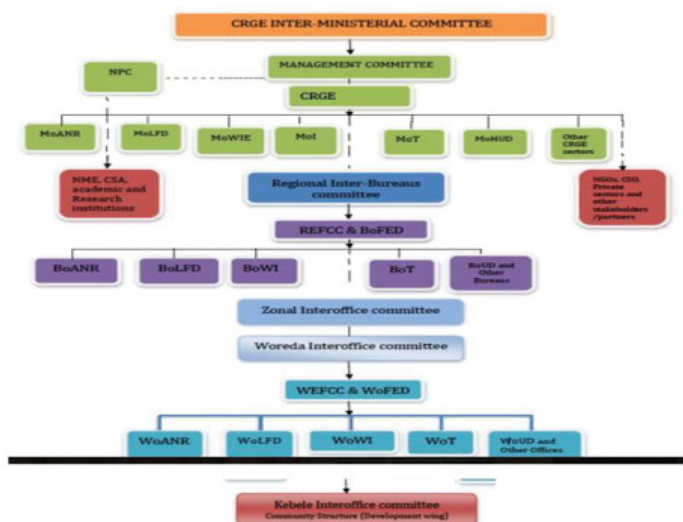


Figure 4: NAPA-ETHIOPIA governance arrangements.

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water sector strategies and programmes to some extent, future climate projections and socio-economic scenarios are rarely incorporated into these designs. These observations are supported by research conducted by Tearfund which found that in most developing countries 'climate risk considerations are not being factored into water sectoral planning and implementation in a systematic way' and that 'institutional structures are currently inadequate' [29].

Communication mechanisms between ministries with a stake in water resource management seem fairly underdeveloped and institutions for effective water governance are relatively weak [32]. These capacity constraints make it difficult to coordinate and implement water sector development activities or initiate adaptation mainstreaming. Like many other African countries, Ethiopia has recognized that it is likely to need additional external financial and technical assistance to tackle climate change effectively [33].

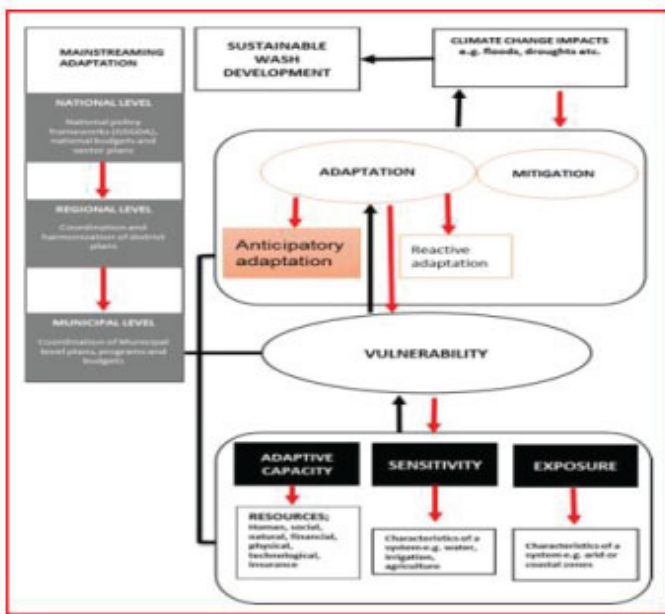


Figure 5: A conceptual model for mainstreaming climate change adaptation measures into development planning at all levels of government. The red arrows show the normal processes of adaptation, while the black arrows show feedback loops.

### Benefits of mainstreaming climate change adaptation into regional planning of least developed countries

Mainstreaming climate change adaptation is the iterative process of integrating considerations of climate change adaptation into policymaking, 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 .It is a multi-year, multistakeholder effort grounded in the contribution of climate change adaptation to human well-being, pro-poor economic growth, and achievement of the Millennium Development goals ( MDGs). It entails working with a range of government and nongovernmental actors, and other actors in the development field . 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 [34].

Mainstreaming climate change adaptation can occur at the strategic level or the operational level. 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 . 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.

### Climate change adaptation into regional development planning of regions in Ethiopia

Ethiopia’s base of natural resources is the foundation of any economic development, food security and other basic necessities of its people. 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. The population of Ethiopia as High this is a preliminary figure which has been disputed by the UN and now by Ethiopia themselves), much less than recent (2007–2010) estimates Ethiopian population ranging from 150 to 170 million and it is the 8th most populous nation in the world. Ethiopia is a low-lying, coastal country. More than 80 percent of the land is situated on the deltas and floodplains and drought. Every year, these rivers flood a majority of the delta areas. Ethiopia also receives large amounts of annual rainfall concentrated mostly during the four-month monsoon season from June through September, leading to

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loss of life, homes, and livelihoods, as well as increases in the spread of water- and vector-borne diseases. In contrast to the monsoon season, a lack of rainfall during drier months causes droughts that lower crop yields, increase food stress and scarcity, and lead to higher food prices overall. The dry season is also associated with lower river flows. In addition, strong storm surges from cyclones often ravage coastal areas, causing significant loss of lives and damage to property and livelihoods. Extreme high tides erode coastal lands and embankments. Flooding, erosion, and saline intrusion all threaten Ethiopia's water infrastructure, which has frequently been breached during storms, cyclones, and floods that have led to complex humanitarian disasters [35,36].

### Conclusion

Generally to Clinch that this vibrant review paper focus on approaches and practices of mainstreaming climate change adaptation and mitigation issues into development planning. And it sights as the relationship between climate change adaptation and mitigation into development; it makes sense to address the two in an integrated way, through 'mainstreaming'. Ethiopians National Adaptation Plan builds on ongoing efforts to address climate change in the country's development policy framework, including the Climate Resilient Green Economy strategy and the second Growth and Transformation Plan, as well as sectoral climate resilience strategies and regional and municipal adaptation plans. Its goal is to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience.

Ethiopian national adaptation plan aims to strengthen holistic integration of climate change adaptation and mitigation to development planning in Ethiopia and long-term development pathway, supported by effective institutions and governance structures, finance for implementation and capacity development and strengthened systems for disaster risk management and integration among different sectors. Over time, Ethiopia aims to proactively and iteratively pursue further integration of climate change adaptation and mitigation in development policies and strategies, including macroeconomic and sectoral policies and strategies at the national level, as well as Regional plans and strategies to achieve sustainable, climate change resilient- green economy.

More importantly, incorporation of climate change adaptation and mitigation measures into development plans, programmes, projects and budgets can reduce the adverse impacts of climate change on the sustainability of development programs and projects. In this way, development interventions can become resilient through

climate-proofing. In a similar way, people's adaptive capacities, particularly through their sustainable development practices, can be improved and their vulnerability levels reduced through the integration of climate change adaptation into development plans. One way of integrating climate change adaptation and mitigation into sustainable development planning issues is through the process of mainstreaming. Mainstreaming climate change adaptation and mitigation is the process through which the risks of climate change are inherently built into the objectives of development projects.

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