Chapter 12
Integrating Microfinance, Climate Finance and Climate Change Adaptation: A Sub-Saharan Africa Perspective

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Abstract Climate change is arguably one of the World's gravest environmental and developmental challenge that has subsequently necessitated a re-contextualisation of many seemingly unrelated subjects such as poverty reduction, economic development, green growth, sustainability, equity and justice, trade, technology, investments and finance, and innovation.

In Africa, managing climate change is hampered by Africa's adaptation deficit as caused by a lack of institutional, financial or technological capacity to adapt effectively; and a lack of effective delivery mechanisms to channel climate finance resources at the sub-national level, particularly to target the poor who are also often the most vulnerable to the impacts of climate change.

In-order to encourage debate and discussion on the role to which microfinance may have in improving climate change mitigation and adaptation, this paper expounds upon the Microfinance-Climate Finance Framework that was shortlisted for the 2014 UNDP MDG Carbon Climate Finance Innovation Award. The paper shows that microfinance institutions in Africa may be sustainable mechanisms for financing climate change initiatives whilst promoting rural development and financial inclusion. Additionally, successfully adapting to climate change requires policy makers to focus on empowering the youth to transform them into (social) entrepreneurs capable of reducing social marginalisation and youth unemployment.

Keywords Clean Development Mechanism (CDM) • Entrepreneurship • Financial inclusion • Food security

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Introduction

Poverty is a contributing factor to environmental degradation and a loss of natural resources in Africa (Lesolle 2012) hence can be a contributing factor to the underdevelopment that is present in most African countries. In Sub-Saharan Africa (SSA) the average income per capita in real terms is currently lower than it was at the end of the 1960s, and life expectancy is lower now than 30 years ago as incomes, assets, and access to essential services are unequally distributed (World Bank 2013). Additionally, the greatest food security challenges overall remain in SSA, which has seen particularly slow progress in improving access to food, with sluggish income growth, high poverty rates and poor infrastructure, which hampers physical and distributional access (FAO, IFAD and WFP 2014a). The poverty of SSA has many dimensions and causes (both internal and external) which include bad luck, initial conditions, and an unfavourable international economic environment which are a manifestation of and an outcome of poor policy choice and bad governance (Luiz 2006). Climate change is anticipated to make efforts to attain the Millennium Development Goals (MDGs) challenging and/or reverse the achievements already made towards attaining the MDGs (GoK 2010). Consequently, there is therefore an urgent need for the international community and African governments to put in place effective poverty and development policies, and climate change policies that can simultaneously address poverty and climate change issues. Additionally, the proposed Sustainable Development Goals are urging stakeholders to reduce the vulnerability of poor people to climate-related extreme events and other economic, social and environmental shocks and disasters as a means to end poverty (UNSD 2014).

Climate change policy debates have largely focused upon estimating adaptation costs, ways to raise and to scale-up funding for adaptation, and the design of the international institutional architecture for adaptation financing consequently ignoring discussion on actual delivery mechanisms to channel these resources at the sub-national level, particularly to target the poor who are also often the most vulnerable to the impacts of climate change (Agrawala and Carraro 2010; Rong 2010; Hyder 2008; Bodansky and Diringer 2014). Within such a context, arguably the impact to which most climate change programmes could have on influencing inclusive climate resilient development could be limited due to a lack of emphasis on strengthening the participation of marginalised groups. In-order to ensure that the post 2015 Development Agenda effectively addresses inclusive growth and climate change issues, various policymakers in Africa developed The Common African Position (CAP) as Africa's official voice on the post-2015 Development Agenda. According to the CAP, Africa's post 2015 development priorities focus on six pillars namely: (i) structural economic transformation and inclusive growth; (ii) science, technology and innovation; (iii) people-centred development; (iv) environmental sustainability, natural resources management, and disaster risk management; (v) peace and security; and (vi) finance and partnerships (UNECA 2014a). However, how these pillars will be transposed into national development

objectives, models and strategies, and how these pillars will be compatible with wider aspirations of the international community are issues that require further investigation as previous efforts on development and climate change agreements point out that uncertainties in predicting actual climate change and its impacts due to problems in estimating future global emissions of greenhouse gases (Hyder 2008) leads to disagreements on the roles and commitments to which developed and developing nations have to manage climate change.

Timilsina et al. (2010) consider the involvement of private sector stakeholders into socio-economic projects in Africa to be contingent on the removal of several barriers, such as market failures, lack of infrastructure and institutional capacity, lack of financial resources, and foreign investors' perception that investment in SSA is risky. These issues are particularly crucial as there is now a shared understanding that tackling climate change will not be possible without major mobilisation or a 're-channelling' of private finance hence tackling climate change requires unprecedented private investment and a transformation of common business practices (UNEP Finance Initiative 2014). Noting that climate change and poverty are two aspects that can seriously hamper the development of Africa, this paper aims to contribute to the existing body of knowledge on various policy responses and strategies that can be deployed in-order to enhance funding for climate change mitigation and adaptation initiatives.

Microfinance is a development tool that is considered to have positive impacts on poverty, income, savings, expenditure, and the accumulation of assets, as well as non-financial outcomes including health, nutrition, food security, education, women's empowerment, housing, job creation, and social cohesion (Van Rooyen et al. 2012). Arguably microfinance may be an ideal tool that can address the proximate causes of Africa's vulnerability to climate change. Consequently this chapter aims to encourage debate and discussion on the role to which microfinance may have firstly in supporting climate change adaptation in the agricultural sector and secondly in energy sector based climate change mitigation activities. Sections "Climate Change Impacts on Food Security and Agricultural Development" and "Climate Change Mitigation and Energy Access Policy Considerations" examine: SSA's food security and energy development challenges and opportunities in the light of current African development aspirations. Section "A Microfinance-Climate Finance Framework for Inclusive Growth" expounds upon the Microfinance-Climate Finance Framework that was shortlisted for the 2014 UNDP MDG Carbon Climate Finance Innovation Award. This framework is presented as a business model that microfinance institutions can use to enhance their mobilisation and disbursement of funds for climate change and poverty reduction activities in various contexts. A discussion then follows in section "Discussion" to highlight the enabling environment which could assist microfinance to improve climate change adaptation measures in Africa. A conclusion then follows in section "Conclusions". The paper shows that unlike market based climate finance instruments, microfinance institutions can utilise various business models hence presenting sustainable mechanisms for financing climate change initiatives whilst promoting rural development and financial inclusion.

Climate Change Impacts on Food Security and Agricultural Development

Climate change creates a double inequality through the inverse distribution of risk and responsibility. Developed states are responsible for climate change, but are forecast to confront only moderate adverse effects; least developed states are not culpable and yet experience significant threats to livelihoods, assets and security (Barrett 2013). About 70 % of Africa's population and roughly 80 % of the continent's poor live in rural areas (more than for any other region) hence improved agricultural performance in Africa can increase rural incomes and purchasing power for the continent's largely poor majority, but only if there are efficient, sustainable and widely accessible rural financial systems which can achieve pro-poor growth and poverty reduction goals (Mwenda and Muuka 2004).

Agriculture can be considered as the principal foundation for Africa's growth which could lead to the continent's structural transformation if the agricultural sector acts as the hub and a conduit that will influence the continent's thirst for a performing, productive, resilient, entrepreneurial and climate smart agricultural sector (UNECA 2014b). It has been pointed out that capital intensive industries and fast-growing sectors (e.g., mining, construction, communication, etc.) neither absorb a majority of rural and urban job-seekers nor provide adequate arrangements that are purposefully set to link up with and benefit slow-growing sectors by way of markets for their produce/products. This results in capital intensive industries and fast-growing sectors having a limited potential to promote growth that culminates into reductions in poverty, rural–urban inequalities and gender inequalities (UNDP-Zambia 2011; GoT 2011). However, a focus on agriculture sector based growth can lead to an improved development path that can lead to poverty reduction and inclusive growth because of the high labour requirements and employment opportunities from some agricultural systems. Moreover, UNECA (2014b) consider agricultural development that enhances climate change resilience to be feasible where there are effective climate policies and a presence of both public and private institutions that can efficiently implement those policies, for example, through improving coordination and mainstreaming of climate change policies in national development plans; and developing a low carbon, clean energy development pathway to rapidly scale up clean energy technologies. This therefore points out that the agriculture sector does not only have opportunities for creating employment but also has a role to play in improving the resilience of communities to climate change. Since a majority of African farmers are smallholder farmers, exploiting these opportunities arguably depends on how the capacity of the smallholder farmers is developed for them to embrace new technologies and strategies which can facilitate climate resilient agriculture and ensure food security.

Some of the factors influencing climate change adaptation on the continent include wealth, and access to extension services, credit and climate information in Ethiopia; and wealth, government farm support, and access to fertile land and credit in South Africa. Increasing access to information, credit and markets, and

making a particular effort to reach small-scale subsistence farmers are therefore essential components of effective climate change adaptation (Bryan et al. 2009). Fankhauser and McDermott (2014) also point out that inclusive (and low-carbon) growth policies should be promoted as they can increase per capita income which leads to reduction in the impacts of extreme weather events and also increases the demand for substitutes to adaptation such as insurance cover. Microfinance programmes aimed at supporting inclusive growth by aiming at increasing the income levels of various communities to enable then to improve their agricultural output and develop other off-farm income generating activities could therefore enhance food security and climate change resilience.

Climate Change Mitigation and Energy Access Policy Considerations

Access to modern energy is a precondition for human development, and it has been stated that no country in modern times has substantially reduced poverty without a sizable increase in energy services (IGES 2014). Africa is the region with the least electrification rates and least per capita use of energy. Africa's electricity consumption of 571 kWh per capita is about five times less than the world average and when Northern African countries and South Africa are excluded, installed electricity generation capacity in the rest of Africa is about 31 GW suggesting the per capita electricity consumption in the sub-region is much lower than the African average (Gujba et al. 2012). SSA (if South Africa is excluded) is the only world region in which per capita consumption of electricity is falling even though the region and continent has the capacity to overcome the energy deficiencies (Eberhard and Shkaratan 2012). Consequently, by 2030 the number of people reliant on biomass for cooking in the region is expected to increase by some 200 million people and those living without electricity by 150 million (Leopold 2014). Improving energy access rates is desirable because access to energy increases incomes, improves healthcare, education, and security, and reduces labour-intensive practices of all kinds. However, as it stands, the global energy system is the single largest contributor to climate change since the energy sector represents the largest share of global GHG emissions (41 %) and global energy demand is estimated to grow by 33 % (IGES 2014). Reducing energy consumption and GHG emissions from the energy sector is therefore of paramount global importance to avoid catastrophic climate change, but it also means that increasing access to modern energy services for the over 620 million Sub-Saharan Africans living without access to any modern energy services should be done in a sustainable way (Leopold 2014).

Climate finance mechanisms and instruments such as the Clean Development Mechanism (CDM) were developed with the aim of promoting sustainable development and facilitating technology transfers that could promote the deployment of renewable energy. However, where such mechanisms are used, their success in

achieving both roles of mitigating climate change and reducing poverty has been limited or had no effect in terms of poverty alleviation and sustainable development due to a lack of emphasis on strengthening the participation of marginalised groups (Cutter and Piguet 2014). Amatayakul and Berndes (2012) and Timilsina et al. (2010) further assert that carbon credits are there to provide an incentive for various stakeholders to implement projects that can contribute to reducing greenhouse gases; but fall short of solving the financing problem for the projects on their own as carbon revenues could be very small compared to the total investment required in many projects. These issues therefore highlight how community level socio-economic, political and environmental conditions differ from place to place hence make such mechanisms not to be suitable for some countries. In countries that are not suitable for carbon financing modalities, other measures that can facilitate the mobilisation of resources for renewable energy deployment should therefore be explored.

A variety of financial instruments and tools are available for supporting climate actions in developing countries (e.g., grants, carbon credits, concessional loans, green bonds and equity investments). While the effectiveness and suitability of different financial instruments and tools depends on specific climate activities, technologies, project types and the maturity of markets, problems arise in ensuring that vulnerable people are reached or become beneficiaries of such programmes (De Brauw et al. 2014; Agrawala and Carraro 2010). Some suggestions on how various financial incentives and financing schemes such as carbon credits can encourage project developers to reach out to vulnerable groups and improve the deployment of renewable energy particularly in rural areas include incorporating greater flexibility and simplifying the methodological and documentation procedures for the various schemes (Thomas et al. 2010). However, this might not address the other barriers such as the potential volatility of carbon prices which create uncertainties and risks for rural energy projects (Zerriffi 2011) and the preference of project developers to produce the cheapest credits but not the best environmental outcome (Pearson 2007). This therefore highlights how other financing modalities such as microfinance could play a significant role in improving the deployment of renewable energy in rural areas since microfinance models for renewable energy deployment can be designed to reduce the costs of accessing renewable energy technologies for rural people.

In addition to this, African farmers have the potential to implement various interventions which could facilitate climate change mitigation and adaptation in their local communities. For example, some biofuel crops have both climate change mitigation and adaptation benefits. Biofuel can provide a renewable energy source that can mitigate the use of fossil fuels for energy. Biofuel crops can also promote rural development and provide rural livelihoods with adaptation benefits when used as a primary or secondary crop. In Mozambique, depending on the production technology used and institutional frameworks in place (Fig. 12.1), biofuel investments could increase annual economic growth by 0.6 % and reduce the incidence of poverty by about 6 % over a 12-year period (Mwakaje 2012).

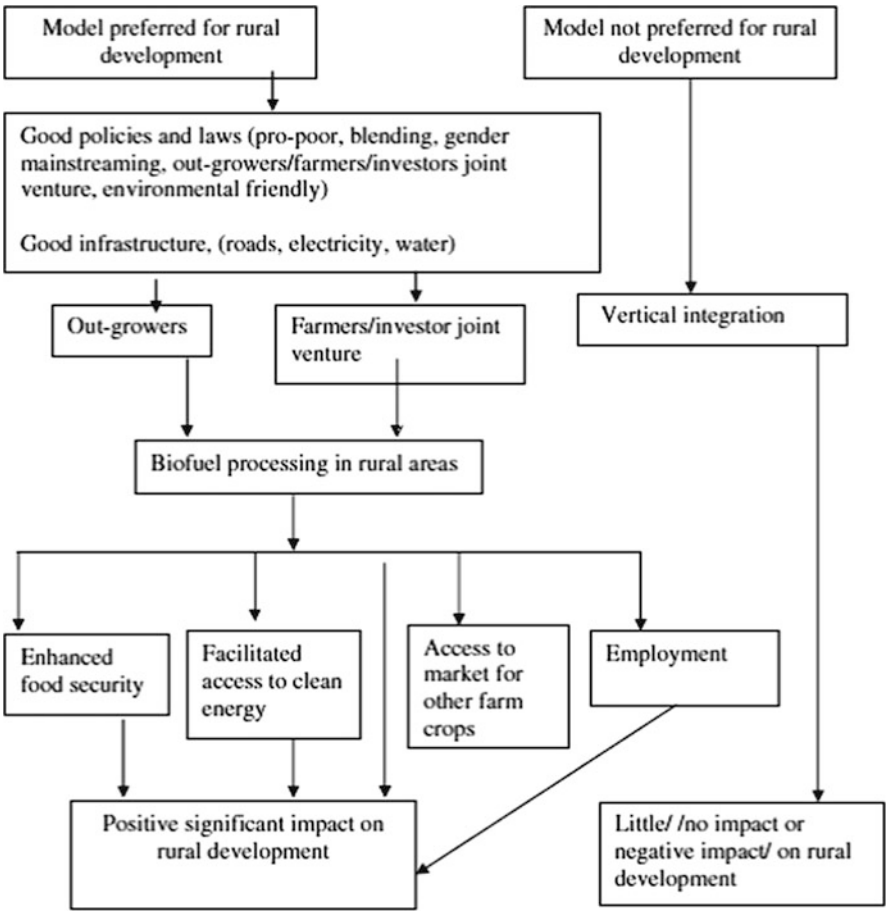

Fig. 12.1 Conceptual framework for biofuel plantations and rural development. *Source*: Mwakaje (2012)

A Microfinance-Climate Finance Framework for Inclusive Growth

Formalised adaptation includes the provision by external parties of additional funds and financing mechanisms to enable various stakeholders to undertake climate change related programmes, capacity-building and policy dialogue; while informal adaptations are on-going processes of human adaptation, occurring independently of external assistance, ranging from small adjustments in daily routines to significant changes in circumstance through particular disaster events (Birkmann et al. 2010). While both actions are shown to facilitate coping and adaptation to climate, however their effectiveness differs. Formalised adaptation interventions enable communities to address a greater number of climate risks; and enhance

agency and security of communities thereby lessening climate vulnerability. On the other hand, informal adaptation interventions only enable communities to adopt more short-term coping behaviours that often compromise future security and agency and show little enduring vulnerability reduction (Barrett 2013). Formalised adaptation interventions are therefore more ideal to support the development of Africa and arguably such interventions should be promoted and efforts should also be made to improve the delivery of such formal adaptation interventions to isolated and marginalised communities to be in-keeping with global aspirations of promoting inclusive growth.

Climate change adaptation entails the development of initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects (de Oliveira 2009) and/or adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (Glemarec 2011). Other commentators consider adaptation to encompasses various behavioural adjustments that households and institutions make (including practices, processes, legislation, regulations and incentives) to mandate or facilitate changes in socio-economic systems, aimed at reducing vulnerability to climatic variability and change (Eriksen et al. 2011). New products, services and business models can therefore also be considered as adaptation measures more especially when they influence a technical shift forward in various sectors leading to enhanced resilience of communities to the impacts of climate change.

The Microfinance-Climate Finance Framework (Fig. 12.2) can be considered as an adaptation to climate change since it is a revolutionalised or streamlined process to which microfinance institutions can use as their business model to mobilise resources and disburse funds to various kinds of stakeholders to assist with climate change management issues (i.e., promoting food security, technology transfers and diffusion, etc.). The framework can arguably also holistically address aspects that can promote climate resilient inclusive growth. The framework may also be considered as a new business model to enable microfinance institutions as well as entrepreneurs and businesses to explore socioeconomic opportunities that can come from enhancing climate risk management. Moreover, the sustainability of some microfinance institutions could be at risk from climate change induced stresses (i.e., where most of their customers are agriculture focused) (Agrawala and Carraro 2010) hence the framework highlights how microfinance institutions can mitigate these risks. Subsequently, the framework was shortlisted for the 2014 UNDP MDG Carbon/Mitsubishi UFJ Morgan Stanley Securities Co. Ltd Climate Finance Innovation Award.

The framework is based on the concept of a revolving loan fund that provides loans at concessional rates in-order to address the financial constraints that many organisations and individuals face when trying to implement inclusive growth focused initiatives. Revolving funds have been shown to be effective in easing credit constraints by reaching poorer communities, providing financial services to those households which rely on informal lending, and leveraging financial contributions from various sources (loan repayments from clients, loans from

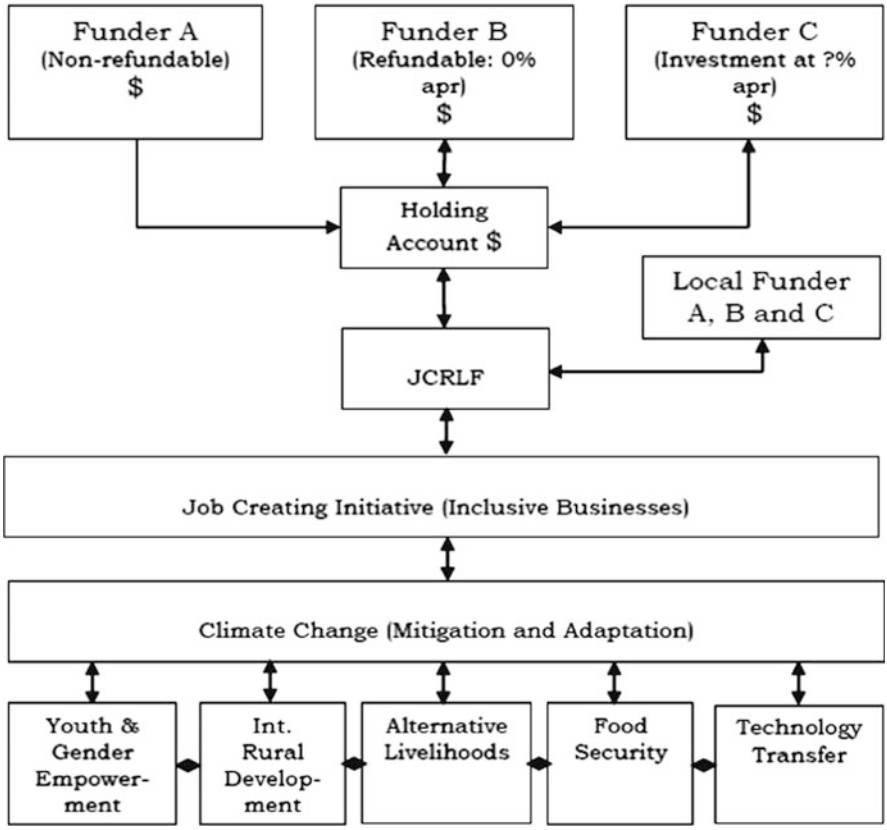

Fig. 12.2 Microfinance-Climate Finance Framework for inclusive growth. *Note*: JCRLF denotes a microfinance institution or revolving fund within a microfinance institution. *Source*: Author

development agencies, etc.) (Menkhoff and Rungruxsirivorn 2011). Revolving funds provide loans rather than grants thereby enabling microfinance institutions to become sustainable by recycling resources over and over again to deliver the 'holy trinity' of outreach, impact and sustainability (Kotir and Obeng-Odoom 2009). Funders in this framework include individuals, governments, multilateral and bilateral development banks, bilateral development cooperation agencies, the private sector, civil society, research and development institutions, and social investors. This framework therefore has a significant scope to tap into private finance more especially since public funding for environmental and socio-economic activities in many developing countries could be erratic.

Technological developments are making the sharing of information and transfer of money easier hence facilitating the growth of crowd-funding and peer-to-peer (P2P) lending/donating modalities. Technological developments are therefore enabling more individuals and institutions to be able to locally or internationally lend/donate money directly to other individuals and institutions. In this context, the

microfinance institutions become mere intermediaries for the transfers or could also be principal beneficiaries of such funding. Additionally, there are many African migrants scattered globally who currently provide around $40 billion a year in remittances. These migrants have the potential to provide more than $100 billion a year to help develop Africa and there is also an estimated $50 billion in diaspora savings that could be leveraged for low-cost project finance (Arezki and Brückner 2012). The framework therefore assumes that these technological developments can facilitate the mobilisation of donations and investments from Africa's diaspora population hence further reinforcing an already robust and sustainable financing structure. More importantly, the framework can enable Africa's diaspora population to be able to receive commercial returns when they provide investments to microfinance institutions using such a framework. This can facilitate enhanced financial flows to Africa for socio-economic development through individuals and the private sector, and also enable private institutions and the civil society to be able to foster socio-economic development more especially where there are government institutional inadequacies.

Discussion

Due to the prevailing global uncertainties and fiscal consolidation in many developed countries, Official Development Assistance (ODA) should at best be seen as a complement and not a substitute for domestic resources, investment and trade. For example, tax revenues are already ten times larger than aid in the African continent and over the past decade, tax revenues have been rising across the developing world thereby making this a potential source for financing the post-2015 Development Agenda. Subsequently, Africa needs to improve domestic resource mobilisation by ensuring financial deepening and inclusion (e.g., domestic savings and microfinance), and strengthening the tax structure, coverage and administration (UNECA 2014a). More effort should also go into developing innovative financing mechanisms and harnessing the private sector to conduct inclusive businesses (AfDB 2013). The financing mechanisms that can support Africa's development could focus on securitising and investing remittances; reducing remittance transfer costs and enhancing their effective management; and developing and strengthening long-term, non-traditional financing mechanisms (e.g., diaspora bonds) (AfDB 2013).

Global climate change mitigation and adaptation is incomplete in the absence of mechanisms for raising the capacity for effective climate change-related planning and management in least developed countries, including focusing on women, youth and local and marginalised communities (UNSD 2014). This follows that Africa's economic growth will not automatically reduce vulnerability to climate change unless growth policies incorporate investment in skills and access to finance to facilitate pro-poor inclusive growth, which will then reduce the vulnerability of communities to climate change (Bowen et al. 2012). Unemployment and

particularly youth unemployment is already a significant challenge that can affect the social and economic development of the continent and poverty levels (UNECA 2012, 2013) hence needs to be addressed in-order to avoid incidences of crime, political violence, social backwardness and social unrest (Timilsina et al. 2010). Africa has the youngest population in the world whereby the continent has almost 200 million people aged between 15 and 24. If Africa's young population continues to grow rapidly, the number of young people in Africa will double by 2045 and the continent's labour force will be 1 billion by 2040, making it the largest in the world, surpassing both China and India (UNECA 2014a). Promoting private sector development and entrepreneurship among young people is consequently considered as part of the solution to address Africa's high unemployment and youth unemployment. Improving access to youth entrepreneurship focused finance, skills development, mentorships, social networks, and technology are considered as strategies that could enable young African entrepreneurs to drive economic growth and social progress in the years ahead (Brixiova´ et al. 2015). As elaborated earlier in this paper, the promotion of jobs in the agriculture and renewable sector have the potential to promote inclusive growth hence need to be integrated into wider aspirations for promoting entrepreneurship and reducing youth unemployment. However, the youth are noted to have limited access to capital and other assets, and they do not perceive agriculture employment (and living in rural areas) as attractive due to the slow modernization of the sector and dominance of traditional subsistence farming practices (FAO 2014b). Subsequently, it can be argued that there is a need to undertake studies on what policies and strategies the international community and African governments can pursue in-order to integrate the youth into local economies in-order to improve the resilience of rural communities.

Conclusions

Economic growth does not automatically lead to reductions in vulnerability to climate change. In SSA, average income per capita and life expectancy is lower now than in the past three–five decades, hence the vulnerability of many communities to climate change could be increasing. Without measures such as improving access to finance and climate information to marginalised communities, climate change will increase the rates of poverty and food insecurity in the sub-continent. Microfinance can potentially improve financing for both climate change mitigation and adaptation initiatives more especially if stakeholders create an enabling environment to utilise Africa's diaspora savings and remittances to stimulate climate resilient growth. Additionally, increases in Africa's population is leading to high youth unemployment rates, hence climate change management policies should also consider how to reduce the vulnerability of the youth to the impacts of climate change since youth unemployment is a proximate cause for poverty and environmental degradation.

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