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Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda

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ABSTRACT

Despite the considerable progress made in the last decade towards building governance systems for climate change adaptation in Africa, implementation still limits positive responses. This study applies an iterative process of field assessments and literature reviews across multiple governance levels and spatial scales to identify constraints to effective formulation and implementation of climate change related policies and strategies in Uganda. Data was collected through sex-segregated participatory vulnerability assessments with farming communities in Rakai district, policy document reviews, and interviews with policy actors at national and district levels. Findings reveal that the key challenges to effective policy implementation are diverse and cut across the policy development and implementation cycle. Policies are mainly developed by central government agencies; other actors are insufficiently involved while local communities are excluded. There is also a communication disconnect between national, district, and community levels. Coupled with limited technical capacity and finances, political interference, and absence of functional implementation structures across these levels, climate change adaptation becomes constrained. We propose strategies that enhance linkages between levels and actors, which will improve policy formulation, implementation and ultimately adaptation by smallholders.

1. Introduction

It is widely acknowledged that policies need to provide a supportive environment that not only guides development stakeholders in planning and executing adaptation interventions but also enables farming communities to adapt to climate change (Berman et al., 2015; Bauer et al., 2011; Cimato and Mullan, 2010; Hallegatte et al., 2011; Otieno et al., 2017; Urwin and Jordan, 2008; Zougmoré et al., 2016).

With this realization, the UN Framework Convention on Climate Change (UNFCCC) was formed in 1992 to facilitate comprehensive national adaptation strategies. Least Developed Countries (LDCs) proceeded to develop National Adaptation Programmes of Action (NAPA), which describe a country's perception of its most 'urgent and immediate needs to adapt to climate change' (UNFCCC, 2011:2). The LDCs are also developing National Adaptation Plans (NAPs) to address the medium and long-term climate change effects.

The Ugandan government signed and ratified the UNFCCC in 1992 and 1993 respectively and made the first national communication to the UNFCCC in 2002, which laid the basis for the preparation of the NAPA that become operational in 2007. The NAPA is regarded as the first national 'policy' that was fully dedicated to climate change adaptation (Friis-Hansen et al., 2013; Hepworth, 2010). The NAPA prioritized nine adaptation projects: (i) community tree growing; (ii) land degradation management; (iii) strengthening meteorological services; (iv) community water and sanitation; (v) water for production; (vi) drought adaptation; (vii) vectors, pests and disease control; (viii) indigenous knowledge and natural resources management; and (ix) climate change and development planning (MWE, 2010). Although implementation of these projects has been criticized by some to be deficient (Friis-Hansen et al., 2013; GoU, 2010; Kissinger et al., 2013; Orindi, 2013), the NAPA process stimulated the nation to plan for adaptation. Following the NAPA, the National Climate Change Policy (NCCP) was developed and approved in April 2015. The overall objective of the NCCP is "to ensure that all stakeholders address climate change impacts and their causes through appropriate measures, while promoting sustainable development and a green economy" (GoU,

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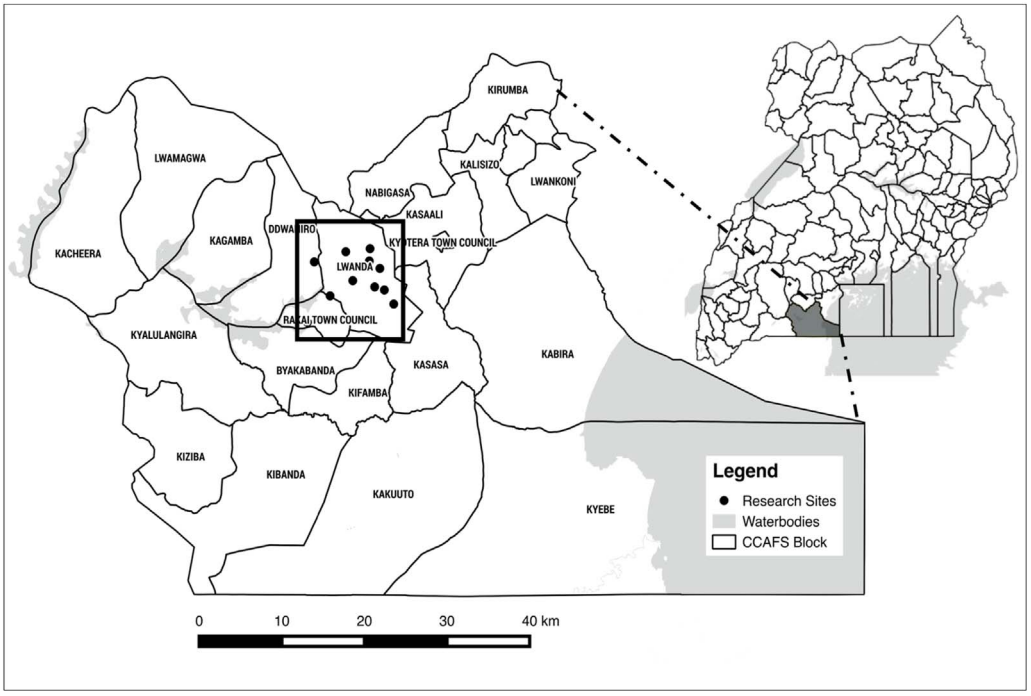

Fig. 1. Location of Rakai district – local level study site.

2015:13). The policy lays out guiding principles for its application, highlights adaptation and mitigation priorities and proposes the necessary legal and regulatory frameworks. It also defines roles of various actors and mechanisms for a coordinated climate change action in the country. Although the country does not yet have an over-arching NAP, an agricultural sector NAP has been developed, with the objective of increasing the sector's resilience to the impacts of climate change, through coordinated interventions that enhance sustainable agriculture, food and nutritional security, livelihood improvement and sustainable development. All these policies are aligned with Uganda's Vision 2040 (GoU, 2015), which acknowledges climate change as a challenge and lays down clear strategies for dealing with it, including development of policies and institutions; strengthening coordination systems at national and local levels; and capacity building of local governments and decision makers, among others.

Uganda has other policies that provide options for potential climate adaptation although they do not necessarily make explicit mention of climate change. These include the National Agriculture Policy 2013, the Uganda National Land Policy 2013, the National Environment Management Policy 1994, the Uganda Forestry Policy 2001, National Policy for the Conservation and Management of Wetland Resources 1995 and National Development Plans.

Despite considerable progress made in developing a governance system for climate change adaptation, findings from Sub-Saharan Africa and Latin America indicate that implementation is often constrained by lack of harmonized sectoral planning (Madzwamuse, 2010; Mamouda, 2011; Pramova et al., 2015; Chesterman and Neely, 2015) and inconsistences between national and local adaptation policies and strategies (Patt and Schroter, 2008; Stringer et al., 2009; Hisali et al., 2011). The few studies conducted on Uganda focused on the NAPA process (Friis-Hansen et al., 2013; Hepworth, 2010; Kissinger et al., 2013; Nyasimi et al., 2016; Orindi, 2013), which formulation approach was prescribed by the UNFCCC and might not be representative. In this paper, we identify constraints to effective implementation of Ugandan policies and strategies related to food security and climate change. Taking Rakai district as a case study, we analyze the smallholder vulnerability context of farming communities in a participatory manner, identify associated adaptation constraints for community-level actors, link policy formulation to the identified constraints, and suggest mechanisms that can enable effective policy implementation to improve adaptation by the smallholder farmers.

2. Methodology

The methodology for this study includes an iterative process of field and desk studies across multiple governance levels. First, a situational analysis was conducted in Rakai between November and December 2012. This was followed up by an incremental review of national and district level policies from August 2013 to June 2014. Key informant interviews were conducted with sub-county, district and national level government officials between October 2014 and June 2015. Finally, the results were validated at district and national level through presentations and receiving feedback at stakeholder workshops and climate change platforms in 2015.

2.1. Vulnerability of livelihoods in Rakai: a situational analysis

Rakai district is characterized by intensive coffee-banana and mixed-crop farming systems. Coffee has been the traditional cash crop while bananas have constituted the main staple crop. Over the last 2–3 decades, farm sizes have decreased (Fermont et al., 2008; Seeley et al., 2010a) and yields have stagnated at levels well below attainable yields due to changes in rainfall patterns, persistent droughts, increased pests and diseases, declining soil fertility and agricultural labour shortages (Abera-Kalibata et al., 2008; Beuving, 2010; Taylor et al., 2011; Wairegi et al., 2010). In an effort to improve their agricultural output, farmers have started to diversify crops and adopt improved varieties of coffee, maize, cassava, beans and potatoes in effort to overcome drought and pest/disease outbreaks (Kizito et al., 2007; Kyazze and Kristjanson, 2011). There have also been shifts from cattle to small stock (goats, pigs, sheep and chicken) due to reduced pasture and water availability, as well as the ease of marketing and acquiring small stock and reduced investment risk and time, as compared to cattle. However, the proportions of farmers adapting positively are still low while the majority remains vulnerable to a wide range of constraints.

The farming system in Rakai is already experiencing climate change impacts from diverse climate change hazards (UNDP, 2013). Due to these impacts, Rakai was selected as one of the NAPA priority districts

(Basheka et al., 2012; GoU, 2007) and is a CGIAR 'spatial climate analogue site' where research is being conducted to draw lessons that can be scaled out to other areas with similar climatic conditions (Ramírez-Villegas et al., 2011). Fig. 1 shows the location of Rakai district.

Focus Group Discussions (FGDs) with farmers provided information on the perceived climatic and environmental changes in the previous 2–3 decades and coping strategies employed; major sources of livelihoods, changes in enterprises and practices and associated constraints, and adaptation opportunities available to improve farm and livelihood resilience. A total of twenty sex-segregated FGDs were conducted in 10 villages of Lwanda and Dwaniro sub-counties with a total of 218 farmers (106 males and 112 females). In addition, through semi-structured interviews, 12 extension officials provided information on the (i) adaptation interventions they promote (ii) their experiences with policy formulation and implementation processes, (iii) the actors involved at various stages and scales, and (iv) the policy implementation constraints encountered. Seven agro-produce and four agro-input traders provided information on drivers of their businesses in the context of climate change. In-depth interviews were conducted with 16 individual farmers who served to triangulate and validate information pooled from focus groups.

2.2. Selection and review of relevant policies and literature

Policy documents were selected based on the constraints identified at community level during the vulnerability assessment. We worked backwards to identify and review policy documents that were associated with the identified constraints. The selection of documents was limited to policies related to agriculture, natural resources and climate change. A desk review of the policies was conducted to identify policy provisions, opportunities, counter-incentives, and gaps that could potentially influence adaptation at local level. The reviewed policy documents included (1) The National Agriculture Policy 2013, (2) National Land Policy 2011 (3) The Uganda Forestry Policy 2001, acts and regulations (4) National Environment Management Policy 1994, acts and regulations (5) National Policy for the Conservation and Management of Wetland Resources 1995, (6) The National Climate Change Policy 2015, (7) NAPA 2007, (8) Rakai district Environment Management Bill, the (9) Coffee and (10) Banana phyto-sanitary ordinances. In addition, relevant grey and peer-review literature was reviewed to further understand the policy formulation and implementation environment at national and district level.

2.3. Key informant interviews at national level

A total of 34 key informant interviews were conducted at national level to understand policy formulation and implementation processes, the various actors involved and their respective mandates. The interviews were structured to link with implementation constraints identified at local level and corroborate key findings from lower levels and from the desk review. Informants included ministry officials, international and national NGO staff, research organizations, development partners (donors) and private sector representatives. Based on the expertise and experience of authors, about 12 respondents were initially purposively selected from the climate change department, national planning authority, ministries of agriculture, water and environment and NGOs that had previously participated in policy formulation. Additional informants were obtained through snowball sampling, targeting individuals that respondents knew to be knowledgeable about policy processes in Uganda, including state and non-state actors. The potential bias of snowball sampling in this study was partly decreased by having 12 different initial starting points for the snowball sampling.

2.4. Validating policy analysis findings at national and district level

Findings from the three previous phases were presented at two national stakeholder workshops (110 participants) and two climate change platforms at district level (143 participants), both for validation and as a way of information dissemination. Feedback from stakeholder meetings helped to broaden the understanding of linkages (or lack of them) between governance levels, and between policy formulation and implementation. Workshop participants included representatives from public and private organizations that work on climate change at national and district levels, plus politicians, media and farmer associations. Lists of participants were drawn with the help of the climate change department at national level and the head of natural resources department at district level. To reduce oversampling from government, researchers were involved in selecting participants in all cases and ensured that a broad range of non-state actors were invited to participate in the workshops.

3. Results

3.1. Changes influencing vulnerability of smallholder farmers in Rakai

3.1.1. Climatic and environmental changes

Fig. 2 presents climatic and environmental changes perceived by women and men smallholder farmers the previous three decades as reported in the FGDs.

According to farmers, rampant tree cutting, without matched replanting, has been caused by charcoal and brick burning and increasing fuel wood demands. The few wealthy farmers are planting commercial eucalyptus woodlots in wetlands and privately owned rangelands. These lands are fenced off, blocking access to the less wealthy for water, fuel wood, seasonal cropping and animal grazing. Prolonged droughts

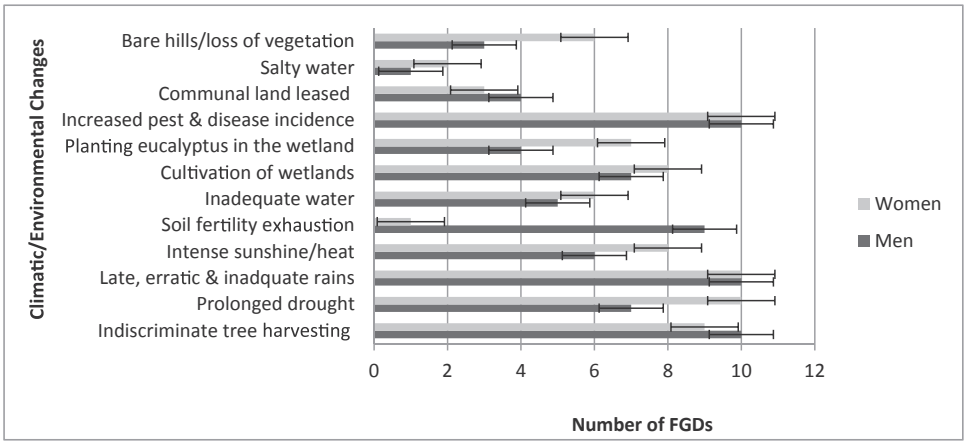

Fig. 2. Environmental changes observed by women and men farmers in Rakai.

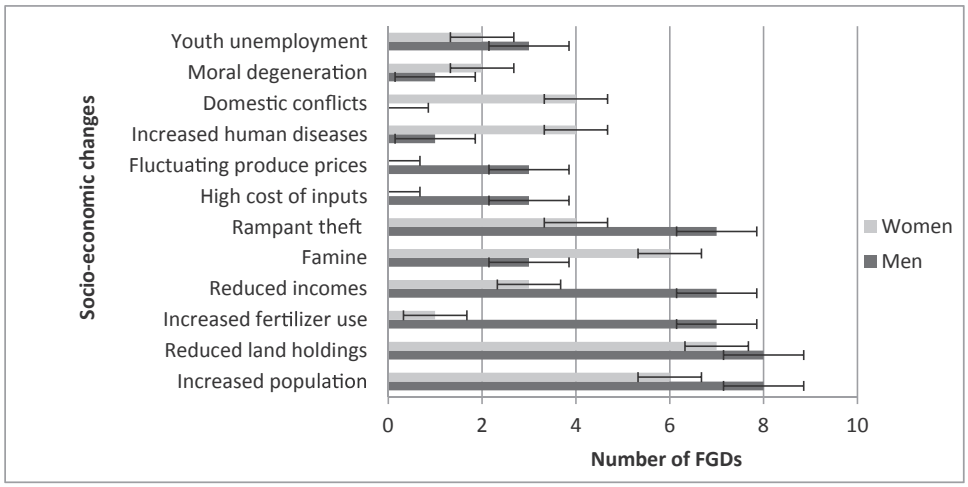

Fig. 3. Socio-economic changes affecting farmers in Rakai.

exacerbate the water stress situation in Rakai and often lead to loss of an entire season's crop in some localities. Male farmers described farming under current circumstances as a form of gambling where you plant and you are not sure what you will get out.

Women noticed some changes more significantly than men; droughts, loss of vegetation, planting eucalyptus in wetlands and intense heat (Fig. 2). The differences point to women's roles regarding water and fuel wood collection. These changes are likely to increase women's vulnerability to climate change more than that of men. On the other hand, men noticed soil fertility decline more significantly than women, also pointing to their source of vulnerability and ascribed role as land owners. These observations implicitly inform what the adaptation preferences would be for men and women.

3.1.2. Socio-economic changes likely to influence adaptation

Fig. 3 presents socio-economic constraints that directly and indirectly affect climate change adaptation.

Some socio-economic changes show significant difference between men and women, also related to roles. Women noticed domestic conflicts, increased human diseases and famine more than men. On the other hand, men observed changes associated with obtaining income and expending or losing it (Fig. 3). Discussions revealed that population has increased leading to land shortages, being fueled by land fragmentation through generational inheritance. For example, according to a female participant in the FGD, in 1976 a farmer in Kanoni village had three acres and later divided it among three sons and himself (he retained half an acre that he later passed on to a grandson). One of the sons received about one acre, which the wife (narrating) has sub-divided into four, for her three sons and herself, "*Note that my sons will have to give land to their children as well… Even what I have now is not enough for me and this is the reason I make mats to be able to derive a livelihood.*"

The droughts and rainfall variability have led to poor crop and livestock production, which results into food scarcity and inadequate incomes at household level. Although farmers report increased use of fertilizers and pesticides to improve production, they barely realize returns on the investment made. This is in addition to the fact that farmers do not have access to good output markets but depend on local traders whose prices are volatile. Women reported domestic violence during periods of food scarcity; men tended to come home late at night having failed to make provisions to the family and would fight if women held them accountable. Older farmers reported that the youth did not seem to have interest in farming but resorted to stealing people's crops and livestock, causing insecurity in the villages.

3.1.3. An analysis of constraints across implementation scales

Fig. 4 presents constraints against implementation scales – plot/farm, household, community, markets and policy levels. The scales are based on a systems framework which argues that constraints are spatially spread across the impact pathway, thus solutions to these constraints should follow the pattern of spread (Hussey et al., 2013). This implies that adaptation solutions require a combination of technological, economic, institutional, and policy interventions across the impact pathway. The categories in Fig. 4 are not static but are meant to illustrate this argument and we acknowledge that the constraints listed are interrelated and some could cut across scales.

Constraints that have significant differences between men and women exist at all levels; household (41%), policy (23%) and community (18%), markets (12%) and plot (6%) levels. At household and market levels, constraints are mainly socio-economic; a mix of socio-economic and environmental issues exist at community and policy levels while environmental issues manifest at plot level. The implication is that solutions to these constraints demand a multi-scale, inter-disciplinary and gender responsive approach.

3.1.4. Findings from policy analysis and literature review

Table 1 presents the key constraints faced by farmers in Rakai and aligns them with appropriate policies and actual implementation on the ground. We observe that there is a disconnect between what the policy provisions are and the reality on the ground. Whereas there are numerous policies and strategies in place (see Section 2.2), few of the principles laid out in the documents are implemented or enforced.

3.2. Underlying causes of policy implementation gaps

The findings in this section integrate an analysis of responses from in-depth interviews with farmers, key informants at district and national levels and feedback from stakeholder workshops.

3.2.1. Inclusion of policy actors in policy formulation and implementation processes

Local governments: Discussions held with key informants in Rakai district indicated that district level policy actors are inadequately involved in national level policy formulation processes. Usually a few district representatives are invited to attend national level consultative workshops. The hosting ministry assumes that the district representatives will consult with local communities before attending the consultative workshop. Besides the limited numbers, the invited participants are not sufficiently prepared to contribute meaningfully because (i) the draft documents are not shared ahead of meetings to solicit contributions, (ii) invitations to participate in consultative workshops are often given within a short time frame that does not allow adequate preparation, and (iii) participating individuals are neither facilitated nor encouraged to consult with lower level governments and

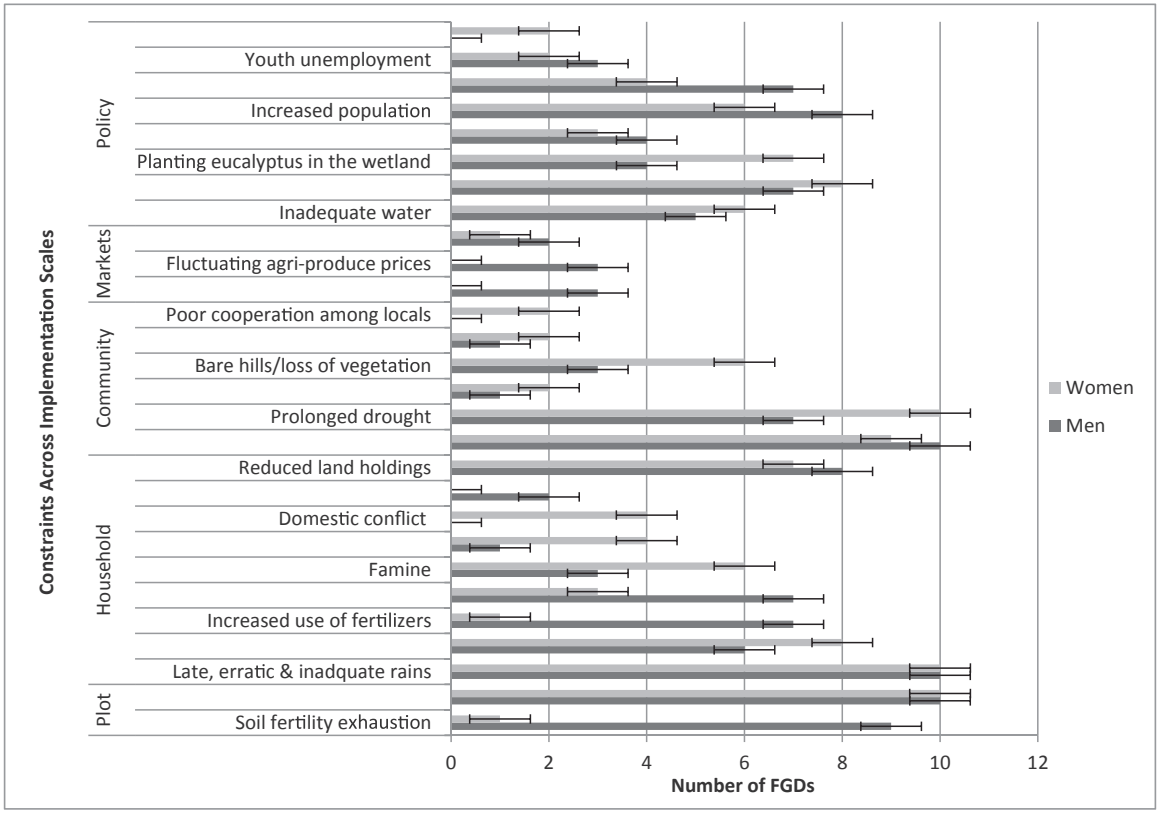

Fig. 4. Constraints segregated by gender and implementation scale.

communities. Key informants from sub-county, parish and communities affirmed that indeed they are normally not represented during consultative workshops nor consulted by district actors. Moreover, none of the lower level key informants reported being invited to policy formulation activities.

Non-state actors: Most NGOs alluded to the same claim that they were not adequately included, and felt that the consultative approach used only allowed them to 'rubber stamp' the policy documents but not to contribute to their development. Nonetheless, the few NGOs that worked well with the government did not have such concerns since they often were actively involved. Government officials acknowledged that CSOs to be important in disseminating policy information and enabling implementation in farming communities, among other things. The participation of research organizations was also limited to a few representatives from the national research institutes. However, workshop participants observed that there was increasing willingness to involve stakeholders, particularly in reviewing draft policy documents and implementation strategies before they are approved.

3.2.2. Coordinating actors for policy implementation

National level actors: Policy documents always stipulate key actors and their roles although coordinating these roles practically may play out differently. Key informants at the national level reported that linkages between MDAs and other actors seemed to be largely unstructured and weak. This in part stems from structural issues inherent in the ministries. Fig. 5 illustrates an institutional framework for climate change policy action, listing major players and their linkages across governance levels. A total of 14 MDAs are named to have a critical role in implementing the NCCP (GoU, 2015: p.42). Nonetheless, both the NCCP and its implementation strategy do not explicitly describe how the agencies will work together to deliver on their assigned mandates. The documents are also silent on how the resources to be used will be generated and distributed.

The enmeshed roles make implementation more complex. For example, the National Climate Change Commission (NCCC) coordinates climate change action in the country, and the same role is assigned to the inter-institutional national climate change advisory committee. The NCCC also ensures integration of climate change concerns into overall national planning and monitors policy and strategy implementation, roles equally assigned to the national planning authority (NPA) in the same document. Similarly, the Policy Committee on Environment (PCE), housed in NEMA, coordinates policy implementation and ensures information flow on resource allocation, yet these roles are also assigned to the NCCC and NPA, and ministry of finance to some extent (GoU, 2015: 41–43). Furthermore, these roles are expected to be replicated at district level yet the MDAs and committees are not necessarily replicated at that level, creating an implementation gap.

Other studies in the region affirm existence of poor coordination among MDAs, sectors and local governments (Jones et al., 2015; Shackleton et al., 2015; Yanda et al., 2013).

District and lower level actors: Section 3.2.1 illuminates insufficient links between the central and local governments, which were perceived by some informants to be the cause for limited conceptualization and implementation of policy strategies. In practice, active coordination between the central and local governments was limited to joint donor assisted projects. In this case, districts were likely to report regularly and the central government tended to provide the necessary backstopping and feedback. However, when donor funded projects closed, actors reverted to the *status quo* and coordination remained largely inactive, signifying lack of ownership. Similar to perceptions at national level, other district departments associated climate change issues with the environment and natural resources sub-sector. Although climate change is reflected in policy documents as a cross-cutting issue, most officials from other departments expressed limited knowledge on climate change adaptation and how it can be integrated in their sub-sectors.

At local level, this disconnect was enhanced by absence of functional implementation structures. Policy documents provide for

Table 1
Relationship between farmer constraints, policies and extent of implementation.

Constraint	Relevant policy	Implementer at district and local level	The reality on ground/implementation gap
• Drying up of crops due to drought; • Lack of animal pasture; • Inadequate water	• Climate Change Policy 2015 • NAPA 2007	• Local governments • Local communities • Local environment committees • Local governments • NGOs and CBOs	• Sub-county leaders, local communities and most of their leaders are not aware of the existence of the climate change policy. • Local environmental committees do not exist; sub-county environment and production committees are not functional. • Technological interventions listed against climate change in district development plans are not appropriately planned for. • Rakai was a NAPA pilot district but many stakeholders were not aware of the existence of such activities.
• Extensive loss of trees • Encroachment on protected forests • Bare hills devoid of trees and shrubs	• Forestry Policy 2001 • National Forestry and Tree Planting Act 2003 • Rakai Environment Management Bill	• NGOs and CBOs • (service delivery and advocacy) • Clan leaders • Local communities	• Most policy statements & strategies have not been implemented; only a few have been implemented selectively. • Donor assisted community forestry did well in Sango bay but activities regressed after project closure. • Locals are neither aware of the existence of the policy nor what it provides for them.
• Cultivation of wetlands • Planting of commercial eucalyptus woodlots in wetlands • Fencing of wetlands by private owners	• ·National Policy for the Conservation • Management of Wetland Resources 1995 • Rakai District Environment Management Bill 2006	• District Council; • District development and environment committees; • Local councils I, II and III • Local environment committees	• Political leaders frustrate efforts by technical staff and environmental police in enforcing policy. • Local bye-laws are not in place. • Wetland Management Plans are non-existent. • The district Environment Management Bill 2006 has been in the Solicitor General's office since 2007 and has never been approved so cannot be enforced
• Leasing and fencing of wetlands and communal lands, buffer areas in drought periods	• Land Policy 2013 • Land Act, Cap 227; • Rakai Environment Management Bill	• District land board and district land tribunal • Sub-county land committee & land tribunal; • Clan members • Local Council Courts	• By the Land Act, Cap.227 Section 44 sub-section 4, government or local government cannot lease land. Also, wetlands are public amenities that should not be fenced to exclude any users. In Rakai, some wetlands have been leased and both wetlands and 'former' public lands have been fenced by those who leased them. • Land is leased in secrecy with a few individuals from the local council signing documents as required. • Clan members are excluded in the process of leasing land
• Increased pest and diseases, notably Banana and Coffee Wilt diseases	• Agriculture Policy 2013 • Coffee Wilt Ordinance • Banana Wilt Ordinance	• Local communities • Private sector • Civil society organizations • Farmer organizations	• Some farmers have failed to destroy diseased plants as prescribed by the ordinances. • Majority of farmers are not aware of the existence of the ordinances. • Some leaders felt the ordinances were blue prints that locals cannot comply with, so did not care. • Limited access to extension advisory services.

implementation committees at the district, sub-county and local levels. The Rakai district environment committee was in place but the district environmental management bill of 2006 is still with the solicitor general, a decade later, awaiting approval. The district environmental police was the main law enforcer and had registered pockets of success in reducing wetland and forest encroachment, and protection of eco-tourism sites. The rebranded sub-county 'production and environment committees' were largely non-functional due to lack of resources. Local committees were non-existent and local council I, which had roles of local level enforcement, have not been renewed since 2006, leading to non-functionality and mistrust among the populace. Eriksen and Marin (2011) affirm that there is disconnect between aspirations of pastoral communities in Ethiopia and national policy ambitions, which reinforced vulnerability of the livestock keepers.

3.2.3. Limited technical capacity

Ministry and local government officials, NGOs, and civil society representatives attested that they did not have sufficient skills to enable long term planning in climate change adaptation and mitigation. Inadequate technical capacity coupled with low integration of research evidence leads to, what is perceived as, poor strategic planning and ineffective polices. There is limited knowledge and practice regarding spatial modeling, socio-economic scenario mapping of current and future climate variability and economic valuation of the benefits of adaptation and sustainable natural resource management, which limits the development and implementation of appropriate adaptation and mitigation technologies. Ministry officials felt that the benefits of sustainable natural resource use are not appreciated by politicians, who are the policy decision makers, because they do not see short term tangible benefits. They cited the need for quantification of environmental benefits in economic terms. Related to limited technical capacity is inadequate staff numbers, a constraint at all policy implementation levels.

3.2.4. Finances, government planning and budgeting guidelines

Local government officials decried insufficient budgets from the central government and limited district revenues. Climate change funds might be available with donors and development partners but accessing these funds requires that climate change issues are clearly articulated. Since such skills are rare, officials fail to secure climate funds from non-government sources. Additionally, key informant interviews at the district level reported that the government Indicative Planning Figures (IPFs) within which districts limit their funding were rigid. Central government funds are tagged to centrally designated priorities that do not reflect local priorities. According to the district officials, the limited flexibility of IPFs for resource allocation to some of the unforeseeable climate change impacts constrains them from innovative adaptation planning. One of the district officials explained that "*inclusion of a likely climate risk into the budget and failure to expend the funds because the risk did not occur is referred to as underperformance*." To him, this has demoralized his innovative capacity and he instead has opted to working with donors instead of government to combat climate change. Tumushabe et al. (2010) confirms the small budgets and finds that they are tagged to central government priorities in the non-productive sectors of the economy, a fact that Nyasimi et al. (2016) attributes to have constrained implementation of the NAPA. In contrast, an official from

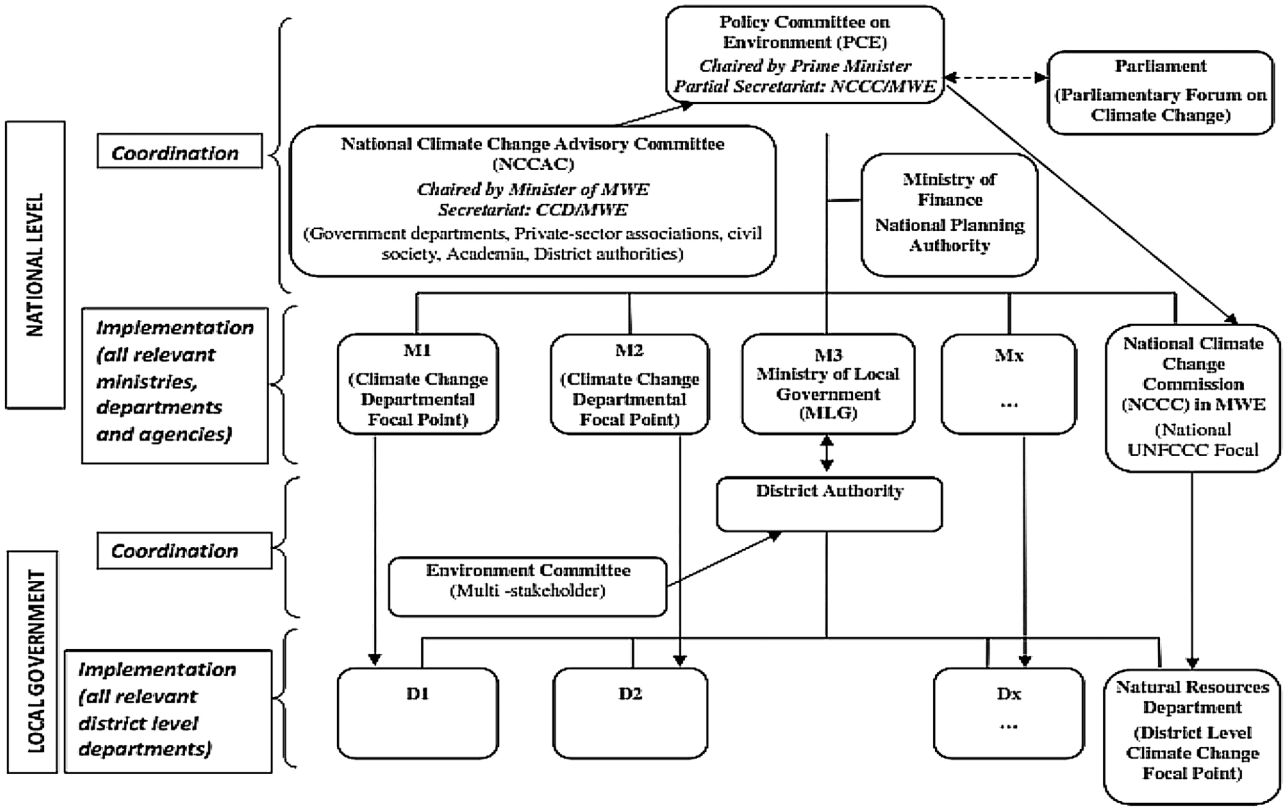

Fig. 5. Organizational chart for climate change action in Uganda.
Source: GoU., 2015. National Climate Change Policy, p. 53

the national planning authority argued that small budgets were an indicator of insufficient planning for climate adaptation, "*Why are we not implementing in most cases all of these (climate change) processes? Íts because we dońt analyze them up to the activities to allocate them budgets*".

3.2.5. Political interference

The challenge of political interference involves conflicts between politicians (policy decision makers) and technocrats (who disseminate adaptation technologies) at district and lower levels. Political interference, as reported by key informants, manifested as (i) politically driven projects that are not environmentally friendly e.g. planting trees in wetlands; and (ii) conflict of interest where politicians attempt to save votes by either ignoring enforcement of policies to avoid antagonizing electorates or defending activities that are destructive to the environment e.g. poaching timber from protected forests. Such tendencies resulted in mistrust between communities and government agencies

> "*…It is very difficult for us. If you harass the people, they will say that we know where we shall meet you – the ballot box. We are then forced to use the technical persons to enforce the law, which was otherwise our role" (Political leader, Rakai Local Government).*

One of the district officials interviewed reported having been confronted by a politician who asked him to stop evicting residents who had encroached on a wetland. After the official had explained the likely impacts of swamp cultivation and trade-offs his voters were likely to make, the politician understood and requested for dialogue between the officer and the communities. This example shows that some politicians may sabotage climate change adaptation efforts because of limited knowledge.

4. Discussion

The findings above are not only unique to Rakai but are similar to what has been found in other regions of Africa (Madzwamuse, 2010; Thondhlana et al., 2015), Europe (Clar et al., 2013), Latin America (Pramova et al., 2015). This implies that both the constraints and associated solutions are applicable to Rakai can be applied in smallholder farming systems elsewhere in sub-Saharan Africa.

4.1. Linkages among constraints to effective policy formulation and implementation

Inadequate actor inclusion in policy formulation and insufficient coordination of climate change action account for (i) the limited awareness of existing policies, leading to lack of ownership and limited compliance, (ii) sectoral segregation in terms of adaptation planning and execution, and (iii) policies that are not informed by research evidence on local needs and constraints. Available research evidence is rarely accessed by policy actors due to poor policy-research linkages and the fact that research products are not translated into a format that is accessible to non-scientists. Studies have indicated that change may not happen unless policy development process and adaptation strategies are realigned to ensure more inclusiveness, involve partners across multiple levels, and is informed by needs and constraints of policy decision makers and rural communities (Cochrane et al., 2016; FAO, 2016).

The limited technical capacity in public offices results in failure to plan appropriately for climate adaptation, limits access to available climate change funding, and use of participatory approaches that would ensure inclusion and ownership of relevant stakeholders. Capacity also constrains government officials from translating national planning and implementation guidelines to action at the local level. The analysis of adaptation actions by Biagini et al. (2014) shows that capacity building

is very important in enabling adaptation at the local level. Yet building capacity of communities demands capacitated human resource in extension delivery.

Political interference has been mainly perpetuated by ineffective decentralization (Goodfellow, 2013; Green, 2008; Lambright et al., 2011; Ojambo, 2012). For over a decade the government has recentralized a lot of the roles that should be played by local governments such as, (i) appointing and remunerating top district leaders, (ii) abolishing local level revenue sources (e.g. graduated tax), and (iii) allocating the small budgets to non-productive sectors. This has placed districts at the receiving end, without decision making power. Also, they are not in a position to hold the top leaders accountable, which has perpetrated a "patron-client relationship" between the central government and the local leaders" according to Tumushabe et al. (2010:14).

Previous research has blamed ineffective policy on limited budget allocations and staffing (Hepworth, 2010; MAAIF, 2010; Rwakakamba, 2009) and insufficient stakeholder participation and linkages (Friis-Hansen et al., 2013; Madzwamuse 2010; Orindi 2013). However, this paper shows that a wide range of inter-related contextual factors work together to constrain effective policy implementation. Resolving such issues demands a multi-actor and multiscale approach. This may require a renewed commitment by the central government to the decentralization principles. Many analysts have perceived involvement of politicians to cause political interference (Environmental Alert, 2009; Meadowcroft, 2009; Ogola, 2013). However, based on the lessons from Rakai, politicians could also provide an opportunity for information dissemination if only appropriately equipped with information and tools to create awareness of the negative impacts of climate change and environmental degradation and the measures that can be taken at the local level by individuals and the community.

4.2. Implications for enabling climate change adaptation in rural communities

As highlighted, having policies formulated does not guarantee implementation of adaptation practices at farm level. The Rakai case shows that ineffective implementation of policies at national and district levels results in a lack of enabling strategies at lower levels. Yet lack of functional by-laws and enforcement structures at lower levels results in constrained access to resources that would reduce smallholders' vulnerability to climate change impacts. Analysts have indicated that smallholders' adaptive capacity is reduced by obstacles that enhance vulnerability e.g. lack of water, limited access to land and common pool resources (Ogola, 2013; Wright et al., 2014). Presence of functional byelaws, ordinances, and enforcement committees help in preserving natural resources such as wetlands, range lands, and community water sources, which are buffer zones that help reduce vulnerability of farmers in difficult times such as droughts.

In addition to having the right institutions in place, there is a need to prioritize adaptation planning, which should be linked to the policy planning processes across administrative levels. We suggest that adaptation planning in the context of climate change should apply a systems approach to appraise adaptation constraints from the plant, plot, farm/household, community/landscape, markets, extension delivery system and policy levels (see Schut et al., 2016). Solutions to the constraints at each level are jointly developed and implemented by multi-stakeholders, through the collective.

5. Conclusion and recommendations

This study shows that a situation analysis should be an integral part of local policy formulation and implementation. Based on the learning from Rakai, we propose general conclusions/recommendations that are important for all districts in Uganda.

Developing new policies or reviewing existing ones in a more participatory and inclusive manner. Several agri-food policies developed in the 1990s are currently being reviewed by the government. There is a need to apply meaningful participatory approaches that allow inclusion of stakeholders from all governance levels during the review or formulation process. The consultative workshops used to engage stakeholders should adopt a bottom-up approach, which would be useful to create awareness among actors, foster ownership of the policies, and coupled with other factors, enable effective implementation.

Investing in human capacity development. Critical capacity enhancement needs include (i) how to quantify socio-economic impacts, and use of participatory and more inclusive approaches in multi scale adaptation planning. Despite previous failure, participatory bottom-up development planning worked well in Uganda during the pilot decentralization phase in the mid-1990s (Lambright, 2011). The approach could be strengthened by making it more inclusive and generating solutions per governance level. In addition, deliberate efforts be invested to develop capacity of future professionals at all institutions of learning to deal with climate change.

Strengthening research-policy linkages. National and international research institutions need to strengthen partnership with government ministries so that government information needs are reflected in their research agendas and scientific evidence is used to inform policy planning and decision-making. Author experiences in engaging policy makers with evidence shows that policy makers are interested in the evidence but the interest/need is bounded by a planning time frame. We also observed that policy makers should be part of the research process, rather than waiting for evidence at the receiving end, so that they can own the evidence generated and integrate it in the policy process. In agreement Cochrane et al. (2016) suggests that researchers could adopt approaches that integrate needs of decision makers from the start of the research process.

Strengthening vertical and horizontal communication through multi-stakeholder climate action platforms. This research shows that multi-stakeholder action platforms across scales have the following benefits (i) improved communication between national and local stakeholders; (ii) increased awareness on the need to adapt and harmonize adaptation messages among actors; (iii) mechanism for skills improvement among extension staff; and (iv) compensate for missing or reinforce existing policy enforcement structures (See Section 3.2.2). In South Africa and Mozambique, such platforms have been seen to holistically address multi-actor and multilevel constraints and provide for the required innovations (Schut et al., 2016; Thondhlana et al., 2015).

The need for effective decentralization. The government of Uganda needs to revitalize decentralization principles. Key among these is (re) decentralizing decision making power to the local governments, including reinstituting functionality of the lower councils responsible for enforcing policies. Reversing the trend will require targeted capacity building of politicians and technocrats in many respects, including their roles in development planning and working with multiple partners for effective delivery.

Further research. More focused research is required in identifying key adaptation capacity needs; models that ensure inclusive participation across governance levels; and conditions under which climate action platforms add value to contextual policy implementation processes.

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