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Social dimensions of crane and wetland conservation in African rural landscapes: insights from Kenya, Uganda and Zimbabwe
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Nyamuro community members inspecting a wetland buffer zone

**Community-based crane and wetland conservation:
Lessons for institutional development from a decade
of project experiences in south-western Uganda**

Abstract

This chapter draws linkages between local institutional development and crane and wetland conservation outcomes based on field experiences from three sites in Uganda. Narratives of how community groups adopted new agendas and re-aligned their activities to successfully protect cranes and wetlands are presented. Social, economic and institutional challenges that can inhibit the effectiveness of local institutional arrangements for crane and wetland conservation are elaborated. Appropriate entry points and approaches for identifying and nurturing social and economic motivations for institutional development are discerned from the findings.

5.1. Introduction

5.1.1. *A species in decline*

According to an unpublished report²⁴ by the then Government of Uganda in 1962, Uganda adopted the Grey Crowned Crane *Balearica regulorum* as its national bird owing to its beauty and widespread occurrence across much of the country. Little is known about the species' population size in the East African country before the 1960s but renowned ornithologist Derek Pomeroy, who started studying the species in the late 1960s, put the population at no more than 50,000 individuals (Pomeroy *pers. comm*). Recent reviews of this wetland-dependent species revealed a sharp decline across the country since the 1970s. Beilfuss *et al.* (2007), estimated that Uganda supported 35,000 individuals in 1984 but the population declined by 50% over the next decade. Results of the most recent review, undertaken in 2013, suggests the species' population in Uganda stands at approximately 8,000 individuals, the second largest population after Kenya's, which is equivalent to 23% of the global population (Morrison 2015). It suffered a 79% global decline over a 45-year period and as a result, was listed to Endangered on the IUCN Red List in 2012 (BirdLife International 2016). It is regarded as the world's fastest declining crane species (Morrison 2015).

The distribution of the key populations of Grey Crowned Cranes in Uganda coincides with human-dominated landscapes detached from formally protected areas (Pomeroy 1987; Olupot *et al.* 2009).

A habitat suitability modelling study carried out by Stabach *et al.* (2009) showed that only 12% of the landscapes that contain suitable habitats for cranes coincide with the country's protected area network. The small crane populations found in protected areas may not be ecologically viable (Pomeroy 1987, *pers. comm*). These factors highlight the importance of conservation measures to secure crane populations and their habitats in human-dominated landscapes.

5.1.2. *Cranes in transformed and shrinking wetlands*

The major cause of the decline of Grey Crowned Cranes, cited by Pomeroy (1987) and Beilfuss *et al.* (2007), is habitat loss due to the extensive conversion of wetlands to agricultural fields. Uganda has a history of wetland conversion dating back to the colonial period (Richardson 1993; Turyahabwe *et al.* 2013). The areal extent of wetlands is estimated to have already shrunk by 30% between 1994 and 2009, mainly due to agricultural encroachment (Wetlands Management Department *et al.* 2009). With Uganda's human population growing at 3.2% annually (World Bank 2016), farmers are increasingly compelled to cultivate new areas, including the wetlands that support crane populations. The increased wetland encroachment and harvesting of wetland plants projected in recent studies (Turyahabwe *et al.* 2013; Kakuru *et al.* 2013) spell a dire future for the cranes. Habitat shrinkage results in more frequent and closer human-crane interactions, which creates leeway for escalation of threats such as direct persecution on farmlands as documented by Olupot *et al.* (2009) and capture of chicks for illegal trade and domestication (Morrison 2015).

The Grey Crowned Crane appears on various national symbols, including the coat of arms and national flag. This visibility has not translated into species protection, however. There are various reasons why the species is vulnerable. First, Grey Crowned Cranes (hereafter referred to as cranes) have no economic significance to local communities and the nation at large, while the wetland systems that support significant crane populations are recognised as production landscapes with great importance for the country's agro-based economy. For instance, valley bottom wetlands in Kabale District support over 50 crane breeding pairs (Muheebwa *pers. comm.*) but (50–60) % of the potatoes consumed in the country are produced on farms located in the same landscapes (Bonabana-Wabbi *et al.* 2013). Second, as Olupot *et al.* (2009) found out, non-economic values (e.g., totems and taboos) attached to cranes by some tribes, which previously acted as deterrents of harmful actions towards the species, appear to have eroded and succumbed under the local communities' quest to satisfy their

²⁴ The report is archived at the National Museum in Kampala and was accessed by the author in October 2011.

socio-economic needs. Third, Uganda's wildlife main conservation focus, and resource allocation priorities are skewed towards protected areas and surrounding landscapes as confirmed in literature on research conducted around these areas (Chhetri *et al.* 2003; Harrison *et al.* 2015). As stated earlier, these areas do not coincide with landscapes that support key crane populations. The species has not been benefitting from wildlife protection mechanisms accorded to other animals in protected areas.

On the other side of the coin, there is a noteworthy ray of hope for the species, its ability to adapt and survive in transformed landscapes (Pomeroy 1987; Meine and Archibald 1996). Habitat suitability studies have shown that the country's southwest region contains wetlands that provide the most suitable habitats for Grey Crowned Cranes (Stabach *et al.* 2009). As reported by Olupot *et al.* (2009), the region is a key stronghold for the species. There is a need therefore for research aimed at determining tenable conservation interventions and conditions under which cranes can continue to thrive in human-dominated landscapes in this region. Against this background, this chapter addresses two general questions. First, what conservation strategies (institutional arrangements and resource use behaviour) are required to ensure the cranes' long-term survival in Uganda's rural landscapes? Second, what are the contextual factors that make crane conservation strategies work in human-dominated landscapes? To answer these two questions, the chapter draws on insights from a decade of field experiences under the Uganda Crane and Wetland Conservation Project (UCWCP). The project was implemented in the southwestern region of the country, with a focus on three wetland systems: Kaku, Nyamuriro and Mitooma (Fig 5.1).

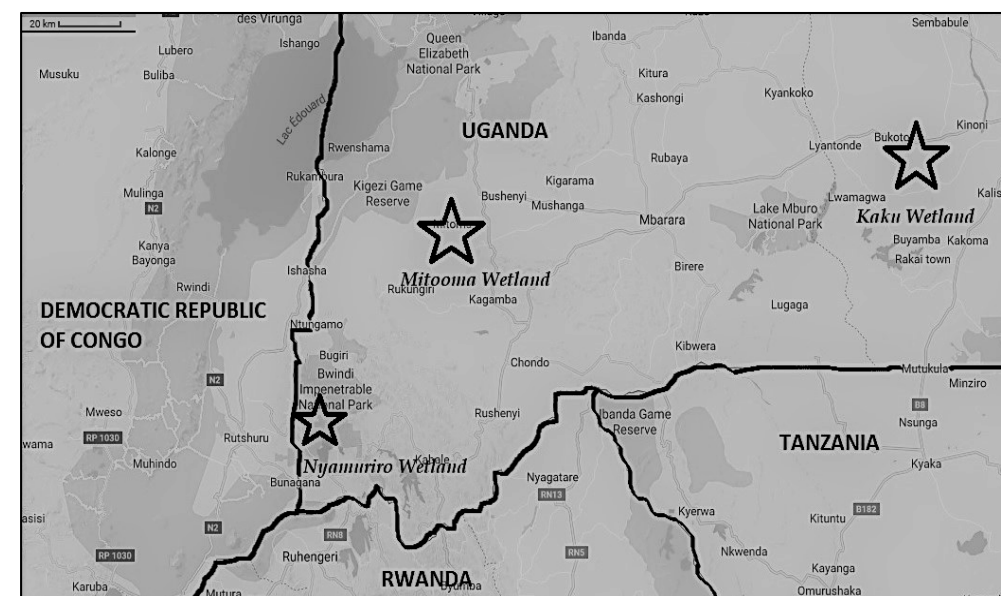


Fig 5.1. Location of the three project sites (depicted by stars) in relation to national boundaries

5.1.3. Evolution and evaluation of community-based conservation

The UCWCP (hereafter referred to as 'the project') was inspired by the global paradigm shift from fortress conservation (state-led, top-down and people-exclusive approaches) to people-centred and community-participatory approaches that call for the prioritisation of local community needs and values. This is usually referred to as community-based conservation (Hackel 1998; Adams and Hulme 2001; Brooks *et al.* 2012). Though the theory of community-based conservation evolved through analyses of cases of communities and wildlife around protected areas and their environs (e.g., Hulme and Murphree 1999; Wells and McShane 2004; DeGorges and Reilly 2009), a body of literature acknowledging that the concept could be extended to projects beyond protected area boundaries is growing (Chazdon *et al.* 2009; Mora and Sale 2011). Whether it is applied in protected areas or rural landscapes, community-based conservation projects share a common trait: enhancing a resource stewardship ethic among local communities characterised by collective actions driven by shared values (Gibson and Koontz 1998). This section discusses the general approach to the evaluation of community-based conservation projects, producing the research questions of the present chapter.

Evaluative frameworks which link the biophysical and socio-economic context with resource management institutions and social and environmental impacts in a defined landscape setting have been developed for use in evaluating community-based conservation projects. Using these frameworks, previous research has shown that in general, the success of community-based conservation projects largely hinges on: (1) enhancing or leveraging local attitudes and values attached to target species and habitats (DeCaro 2008; Van der Ploeg *et al.* 2011) and (2) developing, nurturing and strengthening resource management institutions for balancing natural resource utilisation and conservation (Ostrom 1990; Yami *et al.* 2009).

It has also been shown, however, that the outcomes of community-based conservation projects are context-dependent (Waylen *et al.* 2010; Brooks *et al.* 2012). This has led researchers to conceptualise community-based conservation as an evolving approach that could be improved through extensive documentation of lessons from the field (e.g., White and Vogt 2000; Thompson *et al.* 2003; Measham and Lumbasi 2013). A common approach used to carry out evaluative research focuses on key lessons and factors contributing to success (Brooks *et al.* 2012). As stated by Lyons (2013), labelling community-based conservation projects as mere “successes” or “failures” through an analysis of outcomes of one dimension (e.g., ecological impacts) may not paint a full picture of the social dynamics that shape attitudes, behaviours and resource management institutions. To address this challenge, alternative evaluation methods have been proposed which enable the researcher to gain contextual insight through the analysis of rich stories about site-level developments rooted in local contextual factors (individual or household-level, community level, supra-national) (Pomeroy *et al.* 2001; Brooks *et al.* 2012). This approach of narratives-in-context will also be followed in the present chapter.

The essence of community-based conservation is to put resource user communities at the centre of environmental decision-making, for the dual goal of maintaining the natural resource base for sustaining livelihoods while at the same time protecting habitats and species (Hulme and Murphree 1999; Brooks *et al.* 2013). This is achieved through social processes that empower communities to design rules and regulations for resource use and shared strategies for collective action to curb unsustainable resource use (Chazdon *et al.* 2009; Mora and Sale 2011). These collective bundles of rules, regulations and strategies are defined as institutions (Ostrom 1990; Rahman *et al.* 2012). In natural resource management, institutions create incentives for socially acceptable resource use,

empower local structures to enforce resource use rules, and create a regulatory framework that legitimises the institutions in the eyes of all stakeholders (Ostrom 1990; Imperial and Yandle 2005). The concept of institutions was popularised by scholars researching the common property resource management systems evolving over long periods without external interventions (Ostrom 1990; Imperial 1999). In recent years, the focus has been broadened to also include local resource management institutions emanating from facilitator-driven processes, including government- or donor-funded conservation projects (Morrow and Hull 1996; Gezon 1997; Platteau 2004). Institutionalisation of natural resource management, a process of making collective decision-making and environmental practices regular and socially acceptable within community groups that share resources (Saravanan 2002; Pimbert 2004; Gatzweiler 2009) is now a common approach adopted by many conservation agencies. The UCWCP is an example of an initiative with a strong component of institutionalisation, largely facilitated by a conservation non-governmental organisation (NGO). For this reason, the narratives of the present chapter will be largely institutional.

Program evaluation based on the analyses of local institutions is now a common practice in the quest to draw linkages between social and environmental outcomes of conservation projects. In addition to discerning whether there has been institutional success or failure (Acheson 2006), evaluative research has also been focused on the evolution of these institutions, to identify success factors and bottlenecks to institutional development. Furthermore, a common trait of institutional analyses is the consideration of contextual factors such as biophysical setting, community attributes, socio-economic setting and regulatory frameworks (Imperial and Yandle 2005; Ostrom 2009). These analytical approaches have been used to develop theories on the functions, performance and sustainability of institutions while at the same time generating practical insights for the conservation practitioner. In the present chapter, the Institutional Analysis and Development (IAD) framework (Imperial 1999; Andersson 2006; Ostrom 2011) is used to draw lessons on how to nurture local institutional arrangements for sustaining community livelihoods and ensure survival of cranes in wetland landscapes. Details on the structure, integral elements and utility of the framework are presented in Section 5.2.

Thus, integrating the two general questions presented in the previous section and the basic research question posed in Chapter 1, this chapter addresses the following specific questions:

- What were the institutional and environmental outcomes that resulted from the project?

- What project design and contextual factors contributed to the positive outcomes?
- What were the expected institutional and environmental outcomes that did not materialise?
- What project design and contextual factors hindered the attainment of desired outcomes?
- How can local institutions be developed and nurtured to effectively protect cranes and secure their habitats?

Following these questions, the chapter is structured as follows. In the next section, a brief outline of the evolution and thrust of the project is presented. This is followed by a description of the biophysical and socio-economic characteristics of the study sites. A description of the methodological framework and data collection procedure then follows. In the results section, site-specific institutional development (process and outcomes) and environmental impacts over the period 2004–2014 are presented. The discussion section covers lessons for institutional development to attain species and habitat conservation, including factors identified as having influenced project successes and failures.

5.1.4. *National initiative to conserve cranes and wetlands*

This subsection provides a general description of the project based on unpublished documents compiled by Nature Uganda, including funding proposals, project reports, crane survey reports and species action planning reports. These reports represent the institutional memory of the organisation's efforts to conserve the Grey Crowned Crane since the 1990s.

The Uganda Crane and Wetland Conservation Project (UCWCP), hereafter referred to as the project) was initiated in the early 2000s. It evolved in the wake of discoveries (national and global) on the decline of cranes and national developments in the wetland conservation sector in the 1990s. An international conference, held in Maun, Botswana, in August 1993 and funded by the International Crane Foundation, brought to the fore social and ecological issues affecting cranes and wetlands across Africa. One of the key recommendations of the workshop was the need to initiate country-level crane conservation programs and the importance of engaging local communities and government agencies in addressing direct and indirect threats to cranes. By that time in Uganda, there were government-backed consultative processes aimed at addressing wetland degradation through local interventions and national legislation, which culminated in the enactment of a national wetlands policy in 1995. The wetlands policy and the ensuing national wetland sector strategic plan unveiled in 2001 prioritised the involvement of local communities in the planning and implementation of wetland conservation activities (Wetlands Management Department *et al.* 2009).

Previous ecological studies (e.g., Pomeroy 1987) had highlighted some human-induced threats to cranes in rural landscapes but conservation of the species had remained a low priority for both state and non-governmental entities. Findings from a Master of Science degree research undertaken by Jimmy Muheebwa–Muhoozi between 1997 and 2000 provided an overview of the status and distribution of cranes across the country at the turn of the century. The study revealed a major decline in the crane population since the 1970s and the prevalence of threats to the species emanating from human activities. A major recommendation of the study was to engage local communities through a broad-based conservation outreach programme focusing on the cranes' geographic stronghold, the southwestern region of Uganda. The recommended activities included education and awareness raising targeting local resource users and national decision makers, the development of locally-developed and enforced crane protection and wetland management systems and the forging of partnerships with relevant government environmental and community development agencies.

During his studies, Jimmy Muheebwa-Muhoozi facilitated the formation of school environmental clubs in the catchment of Mitooma and Nyamuriro wetlands as an entry strategy to promote local custodianship of cranes. This marked the beginning of community engagement, which would become the cornerstone of the project. His liaison with the then Africa Program Director of the International Crane Foundation, Richard Beilfuss and his supervisor, Derek Pomeroy, between 2000 and 2002, led to discussions that defined the strategic focus of the project, with a resolution that recommendations from his thesis would guide the initial phase of the project.

A \$20,000 grant secured from the Disney Wildlife Conservation Fund in July 2002 through the International Crane Foundation became the seed funding for the project. Jimmy Muheebwa-Muhoozi assumed the responsibility of full-time coordinator with the project falling under the auspices of the Wildlife Clubs of Uganda. The project goal was to develop models for integrating crane and wetland conservation with community development, which would inspire individuals and community groups within the cranes' range. The funding made it possible to expand the thematic focus of the project from outreach activities involving school environmental clubs to include other community actions involving the broader society (leaders, wetland users, government agencies and district authorities). It also made it possible to introduce livelihood projects designed to demonstrate tangible benefits as alternatives to wetland-based livelihood options that were detrimental to wetland integrity. When the Disney Wildlife Conservation Fund-funded project ended in 2004, the

proponents realised the need to consolidate its success by incorporating the national crane and wetland conservation under the portfolio of Nature Uganda, a well-established nature conservation organisation. Placing the project under the administration of Nature Uganda would translate into tangible benefits, including leveraging funding and improving the project profile among the conservation community between 2004 and 2007. Table 5.1 shows the funding timeline for the project between 2003 and 2013, including the names of the three target wetlands.

Table 5.1. Funding timeline of the Uganda Crane and Wetland Conservation Project

Name of funder	Amount received (USD)	Funding duration	Target sites	Main project focus during funding period
Disney Wildlife Conservation Fund	20,000	2002–2004	Mitooma Nyamuriro	Alternative livelihoods, education and awareness, crane monitoring, wetland management planning, institutional development
IUCN Netherlands	10,000	2004–2006	Kaku Mitooma Nyamuriro	Alternative livelihoods, education and awareness, crane monitoring, wetland management planning, institutional development
USAID (as a component of the PRIME West Project)	5,000	2000–2007	Nyamuriro	Alternative livelihoods, education and awareness, crane monitoring, wetland management planning, institutional development
Whitley Fund for Nature	48,000 48,000 56,000	2008–2009 2010–2011 2013–2014	Kaku Mitooma Nyamuriro	Alternative livelihoods, education and awareness, crane monitoring, wetland management planning, institutional development
Parc des Oiseaux	5 000	2010	Kaku	Alternative livelihoods, education and awareness, crane monitoring
North Carolina Zoo	5 000	2012–2013	Kaku Mitooma Nyamuriro	National crane surveys and crane conservation outreach
Dohmen Family Foundation	5 000	2012–2013	Kaku Mitooma Nyamuriro	National crane surveys and crane conservation outreach

Between 2004 and 2014, the project had six major elements:

- environmental education and awareness,

- promotion of alternative livelihoods,
- formation of and capacity building for site conservation groups,
- community-based wetland management planning,
- wetland restoration activities,
- and community-based monitoring of cranes and wetlands.

Environmental awareness was aimed at prompting conservation action through the dissemination of information on the plight of cranes through presentations at community workshops, drama and choir competitions involving schoolchildren in target wetlands' catchment areas. The project introduced "Adopt a crane" initiatives with an initial focus on schools as a way of promoting practical action in protecting cranes and their breeding habitats. Educational and promotional materials with crane and wetland conservation messages (t-shirts, posters and pamphlets) were disseminated at school and community events. The environmental education and awareness and the "Adopt a crane" initiative were geared towards promoting personal and community attachment to cranes and wetlands. Pilot initiatives for demonstrating livelihood options (fodder and fruit tree planting, bee-keeping, fish farming, small stock production, vegetable gardening) inspired by the wise-use concept were introduced. At each site, the project facilitated the formation of wetland management committees whose responsibility was to enforce community-developed regulations and undertake bi-annual wetland monitoring. This was aimed at developing grassroots conservation leadership comprising local champions, committed volunteers, who would then spearhead both awareness and all practical actions at the sites. Members of the wetland management committees were also involved in the informal collection of data on cranes, including keeping records of breeding pairs, breeding events, causes of mortalities, crane activities and flock sizes. In implementing the project, the thrust was on promoting collective action in addressing social and environmental challenges affecting cranes and wetlands since cranes moved across fields and also because some of the wetlands that supported crane breeding pairs were managed as common pool resources. There were, however, cases when individual and particular households were engaged if the matters at hand were largely linked to actions of respective individuals and households (e.g., cranes breeding on wetlands located on fenced and privately owned plots).

Since 2005, the project has been managed by Nature Uganda. The organisation's role includes financial management, supervisory support and fundraising. As the project coordinator, Jimmy

Muheebwa-Muhoozi has been responsible for the overall implementation of field activities, reporting as well as monitoring and evaluation. Three field assistants, one per site, were engaged to assist with collating crane data and organizing site-focused events such as meetings, field days and collective actions such as monitoring and restoration activities. The International Crane Foundation, in partnership with the South African-based Endangered Wildlife Trust, provided technical support and also assisted with fundraising.

At the national level, the project has operated in collaboration with government agencies responsible for wetland management and local administrative authorities (districts and lower county structures). The Uganda Wetlands Management Department, a body mandated with the responsibility of implementing the national wetland policy and enforcing regulations governing wetland management, was involved in activities such as awareness raising, wetland management planning and delineation of utilization zones. District-based officers from the National Agricultural Advisory Services (NAADS) provided training and technical support in the implementation of livelihood projects. Local government authorities represented by district administrators and lower county officials were also engaged and played a key role in ratifying project activities. The Uganda Wildlife Authority had a peripheral role in the implementation of project activities but was consulted during project planning workshops.

5.2. Methods

5.2.1. *The study areas*

The study area is defined by the three project sites where crane conservation has been underway since the early 2000s. They are located in the Lake Victoria Basin, a biogeographical region known to have some of the highest population densities in Africa (Odada *et al.* 2004). Fig 5.1, presented earlier in this chapter, shows the geographical location of the study sites.

Over the past century, the region experienced environmental problems, which include deforestation, water pollution, soil erosion, and wetland loss (Odada *et al.* 2004). The focal wetlands form part of what used to be an extensive system of papyrus swamps that have, over the years, been encroached and extensively transformed into agricultural lands. Remnants of these wetlands in the southwestern region support at least 70% of the country's total population of cranes. Table 5.2 summarises the

biophysical characteristics, socio-economic factors, ethnocultural traits of communities and resource management institutions at the three study sites.

Table 5.2. Biophysical characteristics, socio-economic factors and institutional arrangements at the three study sites

Attribute	Kaku	Mitooma	Nyamuriro
Description of wetland(s)	Pan-shaped wetland comprising sections covered by open water, papyrus and shorter sedges	Network of extensively converted wetlands associated with streams interspersed by small hills	High altitude valley-bottom papyrus-dominated peatland fed by water from steep-sided hillslopes
Size of focal wetland (km ²)	2.4	0.8	3.6
Annual rainfall (mm)	840	1230	1200
Main land use within 500 m of focal wetland(s)	Vegetable gardening, wet season crop production (beans and maize), livestock grazing	Livestock grazing, eucalyptus plantations, vegetable gardening, crop production (beans and maize)	Crop production (Irish potato rotated with beans and maize)
Land use in the broader catchment	Rain-fed crop production on gently sloping fields, banana plantations, livestock grazing, human settlements	Crop production on hill sides, eucalyptus, banana plantations and human settlements	Crop production, eucalyptus plantations and human settlements on steep-sided hill slopes
Agricultural potential	High for pastoralism and low for crop production	High for crop production (rain-fed cropping system and wetland edge cultivation)	High for crop production (rain-fed cropping system and wetland edge cultivation)
Main resources derived from wetlands	Papyrus, Water for domestic use and irrigation, Fish	Papyrus, Water, Fodder grass	Papyrus, Water
Size of target communities	350 households 6 schools	250 households 5 schools	400 households 6 schools
Tenure patterns	Common access to all resources for locals	Private ownership and management of fenced plots	Common access to papyrus and water for locals

	Household-owned plots on wetland fringes	Common access to resources in main wetland	Household-owned plots on wetland fringes
Ethnic diversity	Baganda but mixed with other tribes especially Bakiga, Banyankole, Bafumbira and Banyarwanda. High ethnic diversity due to large scale in-migration in the 1950s	One dominant ethnic group (Banyankole)	One dominant ethnic group (Bakiga) and significant populations of migrants from Congo and Rwanda
Population density (district level) (inhabitants/ km ²)	240	357	401
Conservation status	No recognized protection status	No recognized protection status	Recognised as an <i>Important Bird Area</i> under the BirdLife International criteria
Status of cranes at the site between 2003 and 2013)	6 breeding pairs Average flock size = 250 individuals	8 breeding pairs Average flock size = 20 individuals	5 breeding pairs Average flock size = 30 individuals

5.2.2. Methodological framework

Data collection and analysis was guided by the Institutional Analysis and Development (IAD) framework originally developed by Elinor Ostrom and other scholars researching community organisation and natural resource governance (Ostrom 1990; Imperial 1999; Ostrom 2011; Whaley and Weatherhead 2014). The IAD framework has been modified over the years and has since evolved into an adaptable analytical tool for analysing the functionality and effectiveness of institutions in addressing resource depletion and degradation challenges emanating from community activities (Ostrom 2011; Whaley and Weatherhead 2014). The core of the framework comprises four elements: the context (biophysical environment, socio-economic conditions, and rules), the action arena (actors, action situations), the patterns of interaction (collective actions, platforms for decision making, rule-making and enforcement) and the outcomes (new resource use behaviour, ecosystem integrity and species survival), as shown in Fig 5.2.

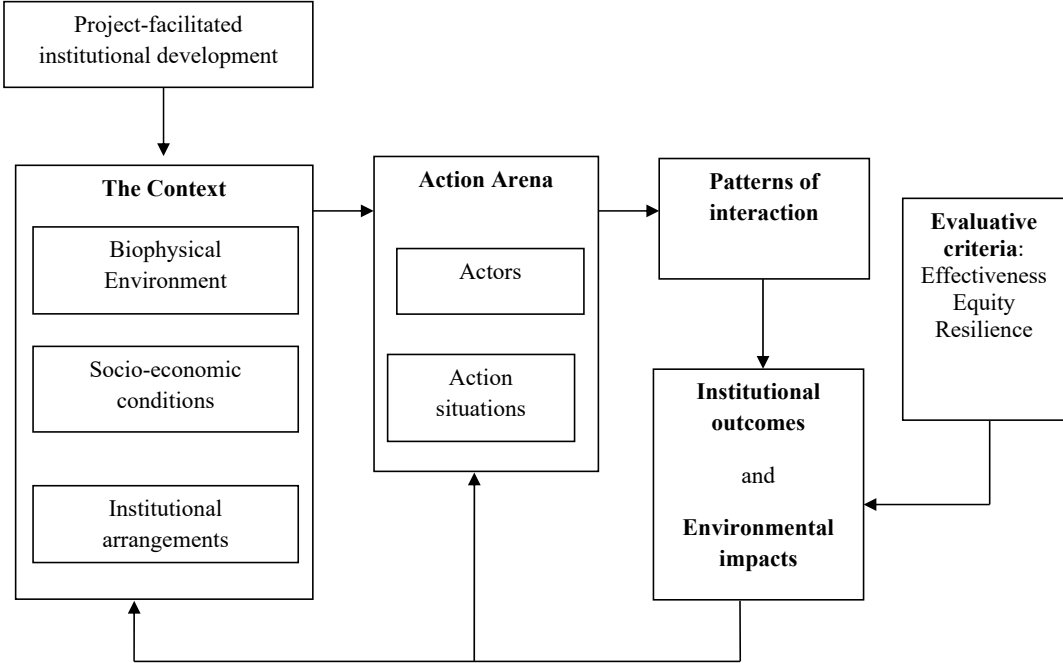


Fig 5.2. Elements of the IAD framework (adapted from Imperial 1999 and Andersson 2006)

The use of the IAD framework starts with the identification of the action arena, which defines the platform or geographical zone where resource users and other stakeholders interact in a defined landscape or site of conservation concern. In our case, the actors in the action arena were the

wetland user community and external administrative units that influence the management of the wetlands, including environmental agencies and district authorities. Since the action arena is largely influenced by external contextual factors, it is critical to include these external factors (social structures, rules, culture, etc.). The next step involves assessing factors and opportunities that enable the stakeholders identified in the action arena to interact at various temporal and spatial scales. These include collective actions, rules, regulations, programmes and policies. In this case, the interaction patterns included community-facilitator meetings, community norms, national wetland management regulations and policies. One aspect considered critical in IAD-based analyses is incentives (broadly defined as motivations, values, material or social sanctions and preferences) which shape the actors' behaviour and decision making. Interactions between stakeholders produce institutional outcomes and environmental impacts. As shown in Fig. 5. 2, diverse evaluation criteria can be used to determine the effectiveness of the institutional arrangements under review. The criteria can include, among others, aspects such as resilience and adaptability in the face of internal and external challenges, nature and level of environmental impacts (e.g., size of habitat enhanced or created and survival of target species). The institutional outcomes and environmental impacts are linked back to the action arena and the context. IAD analyses can be undertaken at different levels of decision-making (Ostrom 2011). In this study, the main focus is on community or decision-making at site-level.

The key strength of the IAD framework is its adaptability and robustness, which allows researchers to modify and include the relevant variables depending on the situation at hand. The IAD framework has therefore been used in a wide range of socio-ecological scenarios and environmental problem analyses; including collective action in commons (Ostrom 1990; Rahman *et al.* 2012), mainstreaming of decentralisation policies (Andersson 2006), environmental policy experiments (Rudd 2004), co-management arrangements (Whaley and Weatherhead 2014), and ecosystem-based natural resource management (Imperial 1999). IAD-inspired institutional analysis enables a researcher to discern and analyse rules, interaction patterns, incentives and environmental outcomes in a given socio-ecological setting (Ostrom 1999; Imperial and Yandle 2005; Ostrom 2011). Acknowledging the adaptability of the IAD framework, we formulated our data collection template in such a way that it would capture the pre-project scenario, the institutional development process, outcomes of the institutional development process, environmental impacts and performance of the institutional arrangements against socially-relevant evaluation criteria, including indicators of institutional resilience and desired biophysical

attributes. Table 5.3 shows key variables that we used in the data collection process, with particular reference to the socio-ecological situation at the three sites. One of the advantages of the IAD framework is its adaptability, which allows evaluators to modify it to suit various contexts. In this regard, the contextualisation of the IAD framework as shown in Table 5.3 was achieved through adaptation of the key elements of the original framework presented in Ostrom (2011) but inspired by similar adaptations by Rudd (2004) and Rahman *et al.* (2012).

Table 5.3. IAD criteria used for data collection and analysis

Universal elements of IAD framework	Key considerations for data collection and analysis in this study
The Context: Biophysical conditions, socio-economic scenario and community attributes	Drivers of past wetland transformation
	Wetland conditions and status of cranes
	Environmental problems affecting wetlands and cranes
	Prevailing management regime (tenure and resource use rules)
	Characteristics of wetland users
	Wetland resource use patterns and motivations
The Action Arena: Action situations and patterns of interaction	Entry strategies for promoting new institutional arrangements
	Community engagement methods for institutional development
	Incentives for participation and acceptance of new institutions
	Practical conservation action at the sites
	Opportunities generated for community interactions
The Outcomes: Institutional changes and environmental impacts	Outputs of institutional development process (e.g., management plans)
	Conservation and resource use rules (made and enforced)
	Evidence of collective action
	Change in land management and wetland resource use
	Impact on wetland ecological and hydrological characteristics
	Impact on crane populations
	Change in wetland access and use rights
Evaluation Criteria: (effectiveness, equity, resilience of institutions)	Effective enforcement of resource use and access rules
	Evidence of self-organisation by community groups
	Ability of community groups to withstand external threats
	Ability to resolve wetland resource management conflicts
	Legitimacy of community groups in the eyes of the locals
	Stability of community group membership
	Level of equity in access to wetland resources
	Success in securing support and recognition by government agencies

5.2.3. Field data collection

The first lap of this research, conducted in 2011, focused on local rules, collective actions for wetland management and successful protection of crane breeding sites, all linked to the project, as

well as evidence of failure to attain the envisaged wetland protection. This exposed a research need to conduct detailed analyses of site-level institutional dynamics and environmental impacts of the project. A decision was then made to carry out this research in June 2013. Data presented in this paper is about project experiences between 2003 and 2013. It was collected by the author in October 2013.

Data collection methods were predominantly qualitative, primarily guided by the IAD themes and variables summarised in Table 5.3. To complement and reinforce the IAD data, quantitative data (e.g., numbers of cranes, numbers of families, incomes, size of land, production levels) were also collected. The main stakeholder group consulted during the data collection process were community members, recognising that they interacted with cranes almost daily, that the integrity of wetlands depended upon their actions and livelihood practices and that they had been actively involved in the project between 2003 and 2013. A register of households that were engaged during project implementation was provided by Nature Uganda. A review of project reports compiled by Nature Uganda over the 10 years revealed different categories of project participants: (1) individuals who had consistently been forerunners in site-based project activities, (2) ordinary community members that were consistently involved in the project, (3) individuals that joined the project during the initial phases but dropped out at some stage as the project progressed. This information was used to ensure that participants that had participated in various capacities and phases were involved during the data collection process. During the data collection process, reasons for non-participation and relationships between participants and non-participants were discerned through conversations with respondents.

Focus group discussions with community group members generated the bulk of primary data required for IAD-based analyses. At Kaku and Nyamuriro, where the focal wetlands were common access resources, project participants were grouped into three clusters (based on their village locations) for focus group discussions. At Mitooma, three focus group discussions were held, two were held with users of the Rwebicere (a large common access wetland) and one with crane custodians on whose plots cranes bred.

Records of project participants kept by project leaders were used to select respondents. Households and individuals that had consistently participated in project activities since 2003 were intentionally invited to the group discussions. The invitation to participate in the focus group discussions was

made open to ensure inclusivity and allow diverse experiences to be captured. Invitations to participate in the focus group discussions were conveyed through the project leadership at each site as per the village protocol. Project leaders at each study site were aware of households that had participated at some stage over the 10 years but were no longer actively involved at the time of this research. These households, that dropped out along the way, were interviewed individually to elicit their views on the project’s institutional dynamics. Semi-structured interviews were held with six key informants at each of the three sites. The informants included District Environmental/Wetlands Officer and two randomly selected village leaders and three local county leaders. The objective in selecting these key informants was to capture the views of community leaders and relevant environmental officers that had worked with the project participants. Questions that were used in group discussions (See Box 5.1) were also used as a guide during interviews with key informants. They also provided contextual information on the target wetlands’ environmental history, land ownership structures, community power dynamics, influence of government agencies and general perceptions about the project.

A total of 46 and 53 community members (active project participants) were engaged during data collection at Kaku and Nyamuriro, respectively. At Mitooma, 23 Rwebicere wetland users and 16 crane custodians attended the group discussion sessions. Numbers and gender of focus group discussion participants and interview respondents are presented in Table 5.4.

Table 5.4. Numbers of focus group discussion participants and interview respondents

	Kaku	Mitooma	Nyamuriro
Focus group participants (active project members)	Group 1: 7 men, 3 women Group 2: 10 men, 4 women Group 3: 8 men, 7 women	Group 1: 8 men, 4 women Group 2: 8 men, 3 women Group 3: 10 men, 6 women	Group 1: 13 men, 5 women Group 2: 11 men, 7 women Group 3: 14 men, 6 women
Non-active /drop out households	3 men, 5 women	6 men, 3 women	6 men, 3 women
Key informants	1 Wetlands Officer (male) 2 Village leaders (both male) 3 County leaders (1 female, 2 males)	1 Wetlands Officer (male) 2 Village leaders (both male) 3 County leaders (all male)	1 Wetlands Officer (male) 2 Village leaders (both male) 3 County leaders (1 female, 2 male)
Percentage of households engaged during data collection	60%	63%	56%

Building on IAD criteria presented in Table 5.3, a semi-structured questionnaire was designed for use as a guide in focus group discussions and interviews with drop-out households and key informants. The criteria were transferred into a topic list for semi-structured focus group discussions, following the standard methodology of the semi-structured interviewing (Edwards and Holland 2013). The questions provided points of departure to explore institutional development and its social and conservation impacts, with follow-up questions being asked to ensure that the broad spectrum of issues presented in Fig 5.3 was covered. A list of general questions used is presented in Box 5.1. Questions were posed to participants in such a way that a story about the evolution of institutions and environmental changes (wetland conditions and crane survival) that took place as a result of the project could be documented. Local languages were used during the group discussions, assisted by individuals contracted to provide translation support. In some cases, respondents expressed themselves in English. On average, group discussions took between 60 and 120 minutes. Interviews with key informants were aimed at verifying facts raised during group discussions. Key informants provided data on the wetlands’ environmental history, land ownership structures, community power dynamics, the influence of government agencies and general perceptions about the project. All key informant interviews took less than an hour.

Box 5.1. Key questions that were used to guide group discussions semi-structured and interviews

1. How has wetland use and users changed over the years?
2. What were drivers of wetland degradation before the project started?
3. What are the specific human actions that have affected cranes and their habitats over the years?
4. How were community groups established and how have they evolved since the project started?
5. What practical conservation actions were implemented by groups and what were the incentives?
6. What has been the impact of the community groups on the community cohesion and collective action?
7. How has wetland access, use and protection changed as a result of the institutional interventions introduced by the project?
8. What challenges have the community groups involved in the project encountered and how have they solved them?
9. What are the notable conservation impacts of the institutional interventions on cranes and wetlands?
10. What has been the role of the government, district authorities and other stakeholders in the project?

Results of focus group discussions and key informant interviews were complemented by personal observations and desktop analysis of pictures depicting evidence or absence of project impacts. Transect walks through the wetlands enabled the observation of vegetation cover and associated water retention and flow regimes that could be attributed to project interventions. Evidence of wetland degradation, wetland restoration, land use change, wetland vegetation and crane breeding sites was captured photographically for subsequent content analysis. A review of project reports compiled over the 10-year project duration also provided an overview of developments at each site. Quantitative data on crane and wetland attributes were obtained from reports compiled by Nature Uganda during the project implementation period.

The use of the IAD framework and the variables in Table 5.3 allowed data collection and analysis to be done in a systematic way, which in turn, made data aggregation, cross-site comparison and identification of commonalities possible. Interview responses were then synthesised as part of an inductive analytic process to discern data patterns, themes and implications of the findings. This enabled the formulation of site-based narratives of institutional development process and outcomes

and environmental impacts. The overall aim was to discern the institutional outcomes at each site and the impact on wetland conditions and crane survival. The evaluation of the ecological outcomes was based on an intuitive extrapolation of the pre-project situation ('outlook'), thus approaching a "with/without" comparison as recommended by Baker (2000) and Bull *et al.* (2014).

5.3. Results

In this section, the results of the IAD-based evaluation of the social and ecological impacts are presented on a site-by-site basis. They are presented under four themes: the pre-project situation, site-specific institutional development processes, site-level behavioural and institutional outcomes and notable environmental impacts. Data presented in this section were primarily generated through focus group discussions and semi-structured interviews. During data collection, some project leaders and ordinary project participants would refer to project records they had kept over the years.

5.3.1. The Kaku story

Pre-project situation and outlook

As of 2004, Kaku was a common access resource shared by livestock owners, plant harvesters, fishers, wetland edge farmers, hunters of small mammals and water users (including residents from the nearby town of Kyazanga). The prevailing open access regime, rooted in local tradition, allowed individuals from villages outside the wetland's catchment boundaries to access plant and water resources. Whereas the patches and points from which water and plants were harvested were open access, cultivators had gradually turned wetland edges (approximately 70% of the wetland's 30 m buffer zone according to Nature Uganda's baseline assessment) into household-managed patches for all-year-round crop production. Five households established small eucalyptus plantations to supplement their income from the sale of timber and to covertly create a sense of territoriality and long-term exclusive access rights over the wetland edges. The pursuit of short-term private benefits, regardless of the impact on wetland integrity, dominated resource use patterns in sections of the wetland where a common access regime prevailed.

Two phenomena were noted to have driven wetland encroachment. Two severe droughts that occurred in 1982–1983 and 1991–1992 caused a recession of water levels and triggered unprecedented waves of wetland-edge farming. Community members interviewed concurred on

the existence of a loosely defined customary management rule, weakly enforced by tribal leadership structures, prohibiting plant harvesters, fishers and hunters to harvest resources for commercial reasons. Previous government policies, which encouraged wetland reclamation had created an enabling environment for uncontrolled encroachment. Though the Uganda Wetlands Policy had already been enacted, no officer had been deployed in the area to enforce the policy provisions. In the words of one community member, “previous governments gave permission to use wetlands in any way to reduce poverty so the mentality that they could still do anything in wetlands prevailed”. There were neither community-level platforms for wetland users to deliberate on wetland management issues nor mechanisms for monitoring use and condition of the wetland.

Since the community mainly valued the wetland as a source of livelihood, there were no purposeful actions to protect species that did not have utilitarian values, such as cranes. Human-crane interactions occurred when community members undertook activities such as fishing on wetland edges as well as using canoes, water abstraction at points dotted on the wetland edges, agricultural activities on wetland edges and grazing and plant harvesting. Constant human presence on wetland edges affected cranes through disturbance during the breeding season. In 2003, six crane breeding pairs were recorded at the site and smaller wetlands within a 2km radius of the main site. The largest flock ever recorded in Uganda (300 individuals) was also sighted at the wetland the same year, making it one of the most critical crane sites in the country. Patches of deep open water interspersed with stands of sedges generally limited human access to middle sections of the wetlands where the cranes bred and foraged. In spatial terms, this created a safe haven for cranes. However, because of the ongoing encroachment, weak wetland management institutions, low conservation values attached to cranes and rising number of wetland users due to population growth, the outlook for the cranes was not encouraging.

Community-based wetland management planning

Crane and wetland conservation awareness outreach during the first five years (2002–2007), was instrumental in sensitising the community on the need for them to collectively develop mechanisms to reduce human-induced pressures on the wetland. This culminated in a multi-stakeholder process to develop a community-based wetland management plan for the site. The wetland management planning process, which took place between June 2008 and July 2009, was facilitated by Nature Uganda and the Uganda Wetlands Management Department. At the community level, lower county leaders and community leaders were consulted and tasked with the

role of promoting the wetland management planning process to the broad spectrum of wetland users. The process provided interactive platforms for joint analysis of threats to the wetland, stakeholder analysis, qualitative valuation of wetland resources, solution-seeking to address threats and allocation of roles among wetland stakeholders. The product of the process was a community vision of how the wetland would be managed, with themes for conservation action that were categorised into technical interventions (e.g., wetland boundary delineation, catchment rehabilitation and rehabilitation of degraded sections), adoption of alternative livelihoods to relieve pressure on the wetland, wetland and species monitoring and conservation awareness outreach. Five wetland management committees, each comprising five members, were formed to oversee the implementation of the plan. The committees comprised representatives of the wetland user groups, holders of political and administrative leadership positions at local level, key informants (teachers, retired civil servants) and politically influential leaders (county leaders, local councillor, ruling party youths).

After the final version of the plan was approved by the stakeholder groups, it was submitted to the Wetlands Management Department (national office) for technical editing and mandatory legal review in 2010. The expectation was that once the plan was approved by the department and ratified by the district authority, it would guide the management of the wetland for five years. Independent of the long-awaited ratification of the plan, project activities implemented between 2010 and 2014 was geared towards fulfilling the resolutions made under the various themes covered in the plan. This included crane and wetland conservation awareness and the introduction of alternative livelihoods. Alternative livelihoods were used as an incentive to address poverty and strengthen community cohesion through the introduction of group-based projects (piggery, market gardening and poultry production), with an average group membership size of 12 households.

Site-level behavioural and institutional outcomes

The expectation that the wetland management plan would usher in new and effective local institutional arrangements for curbing wetland encroachment and unsustainable resource harvesting did not come to fruition. Although Nature Uganda submitted the plan to the national office of the Wetlands Management Department, the ratification process was bottlenecked. The plan was supposed to be reviewed by senior technical officers, including a legal expert before it would be signed by the Minister. By 2014, the review had not been completed. The result was a

period of uncertainty and suspense on the part of the local community and the district authorities, during which the energies for an improved wetland management regime began to wane.

Acknowledging that ratification of the plan was delayed, this research sought to discern changes in community interaction patterns, wetland resource use behaviour and community acceptance and functionality of wetland management committees by assessing site-level developments during the post-planning period (2010–2014). This analysis enabled the identification of design weaknesses (in the planning process) and setbacks imposed by the external environment. For instance, the demarcation of a buffer zone (50 m from the wetland edge) was agreed upon in principle during the planning process but there was no clarity on how to deal with the conscientious issue of cultivators that already had plots within the buffer zone. Although alternative livelihoods were popular among the beneficiaries, two major weaknesses were identified. First, households and community groups receiving start-up inputs for livelihood improvement were not bound by any conditions to perform any conservation actions to reduce pressure on the wetland. Flaws in the targeting criteria, which also translated into a disconnection between the livelihood projects and mitigation of wetland encroachment, were identified, with 67% of beneficiaries interviewed not owning plots on the edges of wetland. Generally, the livelihood options introduced did not become alternatives to wetland-degrading practices but options for complementing food production and income generation. Some households that owned plots of wetland edges opted not to join the livelihood projects and continued cultivating in the wetland buffer defined in the management plan as no-cultivation zones. Flaws in the targeting criteria, that resulted in some households benefitting at the expense of those that had plots on wetland edges, was linked to elite capture. This was exemplified by households that benefitted from the project mainly because they had social connections to political leadership and because they were opinion leaders and champions in community development projects. Using their privileged positions and influence over donor-funded projects, they would access project benefits before the rest of the community did. This inherently made the task of linking livelihoods to conservation challenging.

Despite being recognised by the district authorities as community-based organisations, the wetland management committees lacked the power to effectively enforce simple rules such as the prohibition of hunting and wetland edge farming. This, coupled with the absence of community-defined sanctions for offenders meant that the committees had to pass on cases to the state enforcement agencies (e.g., the police), as was the case when poachers were apprehended in 2011.

On several occasions, they reprimanded individuals involved in prohibited activities, but this did not deter community members from engaging in activities that degraded the wetland. One committee member lamented the lack of enforcement mechanisms and action from the Wetlands Management Department, which created leeway for wetland users to flatly refuse to be bound by the wetland management regulations. The work of the committee was also undermined by politically connected individuals. A typical example was that of an elite member of the community who, despite being confronted by the wetland management committee, claimed to have received permission to harvest wetland plants from a local district official for his brick-making and tree nursery project located on the edges of the wetland. During a group discussion, one participant alluded to the fact some households (who he described as the elites) dissociated themselves from the project simply because they were not directly dependent on wetland resources. Twelve households, who were active during the planning period, were said to have “silently” decided not to be active in the project after their expectations of receiving livelihood inputs did not materialise.

Protracted flooding of the wetland due to heavy rains in 2011 and the following two seasons added a new dynamic in terms of wetland utilisation regime, escalating utilisation pressure on the wetland. It added a new complexity that the wetland management committees had not handled before. Flooding increased the size of the fishing grounds, thereby attracting more fishers and an upsurge in the number of canoes in use. This led to the establishment of three landing sites for canoes and two fish marketing points on the edges of the wetland. Realising the new threat to the wetland, the wetland management committees attempted to regulate fishing access but without success. Between 2011 and 2014, unregulated fishing became a major livelihood activity for the local community, with buyers travelling long distances to come and buy the fish at the site.

Environmental impacts

To a great extent, the wetland management plan was not implemented effectively. The envisaged reduction of threats to the wetland, emanating from unregulated use of wetland resources was therefore realised. The desired scenario whereby the community would purposefully mainstream new management rules and regulate their actions to meet their livelihood needs while maintaining the functions of the wetland remained elusive. As a result, the prevailing management system as of 2014 was not positively contributing to the improvement of the ecological health of the wetland. All the while, however, the wetland zones used by cranes for breeding largely remained unaffected owing to their location in the centre of the wetland surrounded by deep waters, which was not

navigable. The sections where cranes bred and raised their chicks were also inaccessible to humans and livestock due to stands of sedges. Breeding records collected by Nature Uganda between 2004 and 2014 showed that, on average, six pairs bred successfully at the site. There was a common agreement among respondents that the community exercised conscious restraint when interacting with cranes and generally avoided sections containing breeding sites and pointed out that this was a notable impact of the protracted environmental conservation outreach. Grassed patches of the wetland, some only accessible by canoe, provided refuge for hundreds of cranes that flocked at the site during the non-breeding season.

Concluding, the lack of institutional success caused the wetlands to generally follow the negative pre-project trend. However, owing to their isolation from wetland zones used by local communities for their livelihoods, crane breeding sites were not significantly affected by the negative trend. This, coupled with a positive attitudinal change of the community towards cranes, contributed to the protection of breeding pairs and flocks. Thus, the fate of the cranes compares positively with the pre-project outlook. Noteworthy, this success resulted from the pro-conservation outreach of the project and not from its institutional or livelihoods work. It might be thought, however, that the institutional and livelihood work contributed indirectly, because they created a positive reputation of the project, making the community inclined to listen and give something back.

5.3.2. The Mitooma story

Pre-project situation and outlook

One common historical phenomenon discernible from the interviewees' narratives was that the Mitooma area experienced a drastic change in land use and tenure in the 1970s. This happened when individual households subdivided the then public commons (open spaces on hillsides and wetlands) into private farming plots. Coupled with this landscape transformation was the weakening of the influence of traditional authority in land management. By 2004, the greater part of the extensive network of riverine wetlands, previously a common sight in the area, had been subdivided into vegetable gardens, farms for crop and livestock production and eucalyptus plantations. Since most of the plots were fenced, and because the government's environmental agencies had a merely peripheral influence in land management, land use decision-making rested with households that owned the plots, and the general goal of these decisions was to sustain agricultural productivity for crop and livestock production. The only part of the landscape that was still managed as commons was the 0.85 km² papyrus-covered Rwebicere wetland. It was used as a source of plants for fuel, raw materials for making crafts (baskets, mats, trays, hats) and

construction of roofs, ceilings, ropes and fences. Self-regulation, which was part of a system of internalised institutions, dissuaded the community from pursuing private interests in this area. This generally curbed overharvesting, starting uncontrolled fires and harvesting of immature papyrus.

On most plots, the wet sections were strategically left unconverted to maintain good pastures. However, some plot holders drained the wetland through ditching to make soil conditions suitable for crop production. Interviews with plot holders revealed that no interaction and rules for cross-property collaboration existed to ensure sustainable wetland management. Though the middle sections of the Rwebicere wetland were relatively intact, seasonal agricultural encroachment was prevalent on its edges. The occurrence of the thick papyrus stands made large sections of the wetland unsuitable for nesting by cranes. Three breeding pairs were recorded there in 2004. Cranes benefitted from the clearance of papyrus in favour of shorter fodder grass, mostly sedges, as well as the persistence of grass cover due to failure by plot holders to drain excess water from some wetland patches. Seven pairs bred on the household-owned plots on scattered wetlands that, together with Rwebicere, are referred to as the Mitooma Wetlands. Nesting success and the survival of crane chicks were therefore largely influenced by the plot-level management regime. The outlook for the cranes was negative especially on the private plots because it could be expected that plot owners would become ever more effective, and motivated due to population growth, to fully concert them to croplands.

Community engagement to influence land use decisions

The project's process of engaging the community to influence land use decisions for improved wetland management started when the project facilitator was conducting crane monitoring in 2004. The monitoring process involved surveying wetlands located in agricultural plots, 22 in total, and consulting the owners so that they could provide information on breeding events and crane movements based on their day-to-day observations. Given that cranes were highly dependent on these plots for breeding and foraging, a strategy was adopted to promote the concept of crane custodianship. This entailed identifying plots on which cranes were breeding and asking the owners to voluntarily devise a farm management system that would leave the nesting sites undisturbed, while also committing to protect pairs and chicks. The custodianship approach was adopted, acknowledging that households operated as independent social units in managing their plots. Collective custodianship involving a group of wetland users was promoted for the Rwebicere wetland. Custodians were encouraged to document their observations and report to the locally-

based crane monitors, employed By Nature Uganda on a part-time basis. Alternative livelihoods were introduced as an incentive, with 75 households receiving goats, 15 households provided with beehives, 12 households forming a vegetable gardening cooperative. These incentives were popular among community members as they represented tangible motivations for the households to associate themselves with the crane conservation agenda. In selecting beneficiaries, priority was given to households owning plots where cranes bred but others that had shown willingness to be part of the project also benefitted. Under the custodianship arrangement, households were asked to rotate pastures to minimise trampling of sites and reduce human presence near sites. Beehives were placed on the communally managed Rwebicere wetlands to add value and provide an incentive for preventing and putting out fires in the event of an outbreak. The livelihood projects provided a platform for community interaction as they met to discuss tasks and evaluate the performance of the options they adopted. The presence of organised groups also attracted the National Agricultural Advisory Services (NAADS).

Custodianship arrangements and conservation impacts

The promotion of custodianship arrangement resulted in notable and desired change in the management of plots. Evidence of conscious and purposeful actions by custodians to ensure the maintenance of crane habitat and survival of chicks was documented. One example is the case of two plot holders that agreed to regulate the grazing of their unfenced plots adjacent to each other and created suitable habitat conditions that led to successful breeding by one pair for five seasons in a row (2008–2014). Previously no cranes were breeding on their plots due to overgrazing. Cases of successful breeding at the other plots were attributed to the appreciation of tangible benefits that the holders received and because the plot holders had a sense of respect for the facilitator, who hailed from the area. The benefits of introducing a new management regime were also confirmed by 12 custodians who acknowledged that controlled grazing had resulted in the re-establishment of papyrus and sedges on their plots. Collection of breeding data between 2004 and 2007 was not consistent. However, records collated by Nature Uganda between 2009 and 2013 confirmed that eight pairs nested and fledged their chicks successfully on household-owned plots.

Another interesting development was the case of a custodian who, out of the attachment that had grown over the years, acted when chicks bred on his plot were captured by a villager, to domesticate them. He took it upon himself to confiscate the two chicks and handed them over to the project facilitator. They were later released and reunited with their parents. This incident was

publicised in the community and when a meeting was convened, the community formulated a local rule making it an offence for individuals to capture chicks for domestication. Over the next five years, no similar cases were reported. Questions on whether there were negative attitudes towards cranes or the project team emanating from the fact that not all plot holders received incentives were posed. The responses can be summed up in the words of one plot holder who did not benefit: “*Those that have benefitted were lucky. If we leave space for cranes to breed, they will also come and breed at our plots*”. Discussions with the community members (non-beneficiaries) also revealed that there was a common belief and understanding that livelihood projects came in phases and therefore those that had not received inputs would benefit in the future. There was therefore a sense of expectation among community members. Despite evidence of successful persuasion of plot holders to integrate crane conservation into farming systems, the proliferation of eucalyptus on wetland fringes was a major negative development that the project did not address. Earlier research findings presented in Chapter 2 revealed that the establishment of eucalyptus plantations became lucrative in the early 2000s as the demand for timber escalated in the country.

Concluding, the promotion of crane custodianship on privately-manged plots led to the adoption of the desired land management techniques that contributed to improving habitat conditions and protection of breeding pairs. This resulted in improved crane breeding success, compared to the pre-project outlook. The livelihood component of the project appears to have been a strong motivation for positive conservation-compatible farming by custodians.

5.3.3. The Nyamuriro story

Pre-project situation and outlook

Up until the mid-1970s, Nyamuriro was an open-access peatland providing papyrus for making crafts and construction, grazing space, fishing grounds and water to local communities. Increasing human population and scarcity of arable land on hillslopes triggered encroachment onto the wetland. The national government at that time encouraged the formation of agricultural cooperatives. Leaders of cooperatives formed by Nyamuriro wetland users assumed the leading role in the creation of wetland plots for crop production. It was also government policy to reclaim wetlands to boost food production. When households were allocated plots in the wetlands’ floodplain, they cleared all native vegetation and dug ditches to drain excess water. The removal of native vegetation resulted in a diminished supply of papyrus and fodder grasses and inequity in access to wetland resources as households cleared, tilled and privatised wetland patches. As of the

early 2000s, most household livelihoods revolved around potato farming (in rotation with beans and maize) on wetland plots of some 400 m² per household and small stock production on steep hillslopes. In 2003, there were approximately 700 of these plots located in the floodplain, with 90% of the plot holders belonging to eight cooperatives.

Apart from appropriating land, the eight cooperatives also ensured that households adhered to set plot boundaries when tilling plots and mediated when conflicts among plot holders arose. They were also responsible for managing plot ownership transfer transactions, ensuring that outsiders did not gain access to land at the expense of locals. There were generally no rules as to how the wetland plots would be cultivated but households were expected to dig and maintain drainage ditches that channelled water to the river that traversed the wetland. This was meant to prevent waterlogging, which would also affect the adjacent plots.

By 2003, only 30% of the wetland was left covered with native vegetation. The four crane breeding pairs observed in that year used wetland patches that had been left unconverted. The clearance of papyrus and the creation of open agricultural fields did create foraging ground for cranes, but breeding ground being more critical for the cranes and the conversion to cropland continuing, the outlook for the cranes was negative.

Community-based wetland management planning process (2002–2003)

In 2001, Nyamuriro was recognised by BirdLife International as one of Uganda's Important Bird Areas owing to the occurrence of bird species of global conservation concern. This prompted the selection by Nature Uganda, of the wetland as a target site for conservation action. Leveraging provisions of the Uganda Wetlands Policy, Nature Uganda worked with the Kabale District Council to facilitate the development of a community-based wetland management plan for the wetland. The goal of the management planning process was to create local institutions for stopping further agricultural encroachment, restore natural vegetation cover and flooding regimes, which would benefit cranes and enhance lost ecosystem goods (especially papyrus). The process involved the promotion of the wetland planning process to ensure it was acceptable to the community, environmental problem analysis to ensure a common understanding of threats to the wetlands and joint formulation of the necessary institutional interventions needed to address the threats. The agreed provisions of the plan were: formation of five wetland management committees, development of rules on permissible land uses and resource harvesting patterns, land use zoning,

restoration of native vegetation through replanting of papyrus and other sedges, and promotion of alternative livelihoods to ease pressure on the wetland. The plan was finalised in 2002, with the wetland user communities accepting that the plan would be used as a guide in the management of the wetland for the coming five years. Cooperative leaders, that already had leadership roles and influence in the community played a significant role in promoting the plan and ensuring that it was accepted by the community. They were doing so in fulfilment of their previously defined role in the utilisation and management of wetlands.

Implementation of elements of the management plan

The management plan became the foundation of all institutional development (group formation, interaction, and collective rules), wetland restoration activities and alternative livelihood projects facilitated by Nature Uganda in 2004. When initial funds were secured to fully operationalise the plan in 2005, two potential setbacks had emerged. During the management planning process, the National Environmental Management Authority (NEMA) had proposed a 10 m buffer, a national standard, as opposed to the 6m preferred by the community. Some community members were suspicious that the involvement of the NEMA in enforcing a cultivation-free buffer would lead to forceful stoppage of all wetland cultivation. Nature Uganda engaged wetland management committee members, drawn from the cooperative leadership, and district officials responsible for local government to defuse the tension. It was resolved that there would be no forced evictions, with committee members expected to act as enforcers, only after they fail would a case be forward to the district authorities. It was also resolved that given the shortage of land; the buffer would remain set at 6 m on either side of the river. It was well known in the community that a respected catholic church leader, who held various other community leadership positions, played a major role in persuading the wetland users to accept the wetland management plan since it would result in the restoration of lost ecosystem services, especially papyrus. Through his initiative, the first wetland management committee was established in his parish. He also facilitated the formation of wetland management committees in two neighbouring parishes. This resulted in leaders of cooperatives, who already had vested powers in land appropriation, supporting the acceptance of the plan by the broader community.

Institutional and environmental outcomes

One contentious issue was how to deal with households that had already owned plots in the buffer zone. They could maintain their crop until the end of the season in 2006, after which they would

not be permitted to plant in the buffer zone. The implementation of elements of the management plan had some impacts, recognised by the community. The decline in the availability of papyrus due to unregulated harvesting associated with common pool resources, was successfully stopped and acted as an entry point to generate community interest to restore the wetland's attributes and re-created shared socio-economic values. A notable success, attributable to collective actions by the community between 2005 and 2013 was the demarcation of non-agricultural zones and re-introduction of papyrus to a 6 m wide buffer on both sides of a 0.9 km stretch of the river. A new rule to prevent people from overharvesting and harvesting immature papyrus was put in place. Wetland patches that had largely remained unconverted were declared as "reserves" for papyrus and fodder grass. There was no marked change in the number of breeding pairs at the site, with six pairs of cranes recorded in 2013, as compared to the five recorded in 2003. The breeding pairs continued to breed on wetland patches, covered by short grass, located in the designated non-agricultural zones. In 2010 and 2011, two pairs used a section that had been restored within the wetland buffer zone.

One success factor was that wetland management committees carried out monitoring activities, once every month, to identify areas where encroachment was taking place and identify culprits. Signboards were put in place to designate the eight reserve patches and rows of *Sesbania grandiflora* were planted to demarcate the buffer zone and areas where crop production was permitted. Twelve cases of intermittent and slow encroachment were identified between 2007 and 2010, but the wetland management committees successfully handled the cases without involving district authorities. The subdivision of wetland patches to be monitored and allocation of monitoring role to committee members in their locality helped them to effectively monitor. Cases of five individuals that were known to have resisted the implementation of buffers but were gradually persuaded to join were also attributed to the use of the chairperson's influence and credentials as an opinion holder. A new rule introduced was that grazing would only be allowed outside the restoration areas, but livestock owners could cut grasses and feed their livestock in the uplands. A loose graduated sanction mechanism was put in place whereby if individuals were reprimanded but ignored the warnings twice, they would be fined 100,000 Shillings (\$28). During group discussions, it was noted that the existence of a local mechanism for reprimanding individuals breaking rules and the involvement of the project facilitator in resolving disputes prevented confrontations.

The project created platforms for community interaction and collective action in the form of project review meetings, joint wetland restoration sessions, group formation to construct terraces and water harvesting structures in the catchment. The evolution of the organised groups enabled the community to be registered as recipients of technical training from the National Agricultural Advisory Services (NAADS), with households registering to undertake fish farming and beekeeping. Over the period 2008 and 2013, 30 households received goats as start-up inputs for alternative livelihoods through project funds sourced by Nature Uganda. The goats were connected to the wetland because they would graze on hillslopes as opposed to the wetland and be fed with fodder fetched from restored wetland sections. *Sesbania* was used innovatively to add value to the wetland and strengthen new institutions as it was used as fodder, source of firewood, agent for nitrogen fixation and as a boundary marker. Creation of the new papyrus motivated community members to join – as failure to participate would effectively mean not having access to the new thriving papyrus stands.

Some cases of wetland encroachment were reported to have been caused by individuals who were bent on frustrating the process. They would let their goats nibble on the *sesbania* seedlings and not attend meetings called by the wetland management committees. They also sought to maintain territoriality so that they would not be governed by the new rules. There were cases where households would undermine the project initiatives by leasing out wetland plots to non-residents who would then encroach onto the restoration zones. It appears these cases were isolated and did not derail the institutional and environmental outcomes.

Concluding, the project scored notable successes in terms of wetland restoration. Building on pre-existing institutions (e.g., the cooperatives), transformative leadership and locally acceptable livelihoods, the institutions were strengthened. This contributed to positive conservation impacts, with cases of wetland encroachment, which had decimated and fragmented the crane breeding habitats, being reduced. Pairs continued to breed on wetland patches, where conditions for successful nesting and chick-rearing were improved through designated no-encroachment zones. This was a positive development, compared to the pre-project outlook.

5.4. Lessons for institutional development

Experiences at the three sites represent distinct narratives of externally supported processes to shape institutions for wetland management and ensure crane survival in human-dominated landscapes. First, the Nyamuriro experience provides insights on how to facilitate community agreement and catalyse collective action for recreating commons in wetland landscapes for livelihood and conservation benefits. Second, institutional failures at Kaku are indicative of the possible challenges, linked to internal community dynamics and environmental factors. Third, institutional successes at Mitooma demonstrate how individual household commitment to maintaining habitats on privately owned wetland patches can be secured. The present section aims to derive practicable lessons from these cases, by way of comparative analysis. These lessons are relevant to Uganda since the country needs innovative institutional interventions to alleviate increasing pressure on wetlands emanating from high population growth and negative legacies of past environmental policies (Kakuru *et al.* 2013; Turyahabwe *et al.* 2013). More general lessons are presented in the final chapter of this dissertation.

The analysis starts from common observations at Kaku and Nyamuriro, the emergence of project-initiated platforms for collective community decision-making to address wetland degradation. This is followed by an exploration of possible reasons why these developments resulted in significant wetland resource stewardship at Nyamuriro and not much change in wetland management regime at Kaku, using the theory of collective action institutions (Ostrom 1990; Potete and Ostrom 2004; Rahman *et al.* 2012). Through this, general factors for institutional successes as well as bottlenecks to institutional development for sustainable management of wetland commons are discerned. Lessons from the quasi-private wetland management arrangements at the Mitooma wetlands are also presented. The lessons are grouped into five categories: (a) the need to look beyond community-based planning, (b) building on existing social capital within project target communities (c) valuing trade-offs and enhancing values of landscapes and species (d) nurturing and managing diverse motivations and (e) leveraging opportunities in the institutional context. These categories are broadly aligned to factors behind conservation success if planning processes are grounded in community values and motivations and supportive local institutional frameworks (Sarkar and Illoldi-Rangel 2010; Biggs *et al.* 2011).

5.4.1. The need for looking beyond community-based planning, as the process alone is not a panacea

In community-based conservation, the presence of a collective vision for sustainable resource management is essential. At both the Kaku and Nyamuriro, such visions were designed successfully, to create buffer zones and leave some undisturbed patches that would be managed as common pool resources. However, because the wetland patches were already being used intensively by some households, the households would inevitably lose some of their resource access and utilisation rights. With that, implementation of the community plan would entail that some community members might feel aggrieved by the new resource redistribution and restriction regimes (Potete and Ostrom 2004), creating a strong risk of dissent among resource users, causing *de facto* institutional failure. As Katz (2000) and Toulmin (2009) put it, navigating these complex tenure and resource use terrains is unavoidable as failure to do so gives rise to conflicts that reduce conservation success. Given the history of encroachment and privatisation of sections of wetland commons in Uganda, institutional interventions can therefore only be effective if there is clarity on how to harmoniously transition from prevailing land tenure and resource use regimes. If actions and processes to address these inherent tenure complexities are not captured, they give rise to paper plans which gloss over key issues and present challenges to the effectiveness of resource management institutions.

The challenge of community plan implementation has given rise to the concept of evidence-based consensus (Varughese and Ostrom 2001; Gruber 2010), in which much emphasis is put on the difference between the plan on paper and the plan in action. Real community consensus can be assumed only on a basis of action and cooperation evidence, to which other authors also add that social and environmental outcome should be visible (Foster-Fischman *et al.* 2001; Innes and Booher 2007). At the Nyamuriro site, such evidence is present. In Kaku, it is absent just as clearly, even though the plan had been designed with intensive community participation. In both Kaku and Nyamuriro, the government failed to ratify the community plans but only in Kaku, the absence of government backing laid bare the community's incapacity to implement. The first lesson from this is that community participation in planning is not sufficient to guarantee implementation in situations where the rights of individual households are really at stake and the government declines to add enforcement capacities to the local scene.

Acknowledging this, we pose the next question: what factors, apart from enforcement by government agencies, lead to effective collective conservation action? Commons research has revealed that transformational leadership, social cohesion, presence of resource monitoring and enforcement mechanisms, enabling state policies, tangible incentives and common aspirations are some of these success-enhancing factors (Agrawal 2001; Cox *et al.* 2010). In the following sections, lessons drawn from the IAD-based analysis, in line with these general conditions, are presented.

5.4.2. Build on existing social capital and if that is yet too weak, build social capital first

Pre-project social cohesion rooted in years of collective organisation and interaction platforms at Nyamuriro became the solid foundation for building new institutional structures for wetland management. In contrast, at Kaku, where the community did not have a similar history of group organisation, interaction and common problems, project efforts to facilitate the implementation of new institutional arrangements were ineffectual. The positive influence of pre-existing local institutional frameworks on the emergence of effective resource management institutions has been documented in a wide range of natural resource management scenarios (e.g., Pomeroy *et al.* 2001; Thompson *et al.* 2003; Rahman *et al.* 2012). Another factor that played a major role in the acceptance of new institutions at Nyamuriro was respected community leadership, in conformity with findings of Pomeroy (2001), Gutierrez *et al.* (2011) and Kontogeorgopoulos *et al.* (2005). In the Nyamuriro case, these were respected individuals that had gained a reputation as visionary and selfless organisers of the cooperative activities, playing a key role in regulating access to farming land in wetland landscapes. These cooperative leaders became integral members of the wetland management committee.

In cases where there are no pre-existing leadership structures for managing resources, facilitating the creation of new community groups becomes imperative. This was the case at Kaku where the expectation was that the new groups would gradually gain respect and authority to enforce rules and actions required to address wetland management challenges. However, as the challenges encountered at Kaku highlight, these new project-linked groups may evolve into entities that may help in various aspects such as monitoring, while being too weak to enforce management plans, even if often seen as effective groups by the donor-funded project initiators (Morrow and Hull 1996; Gezon 1997; Platteau 2004). In retrospect at Kaku, more effort and time should have been invested in the technical and local-political empowerment of these groups (*cf.* Scheyvens 1999). As suggested by De Groot and Tadepally (2008), one way to do so is to start with the implementation

of something relatively easy, and then build on that success. The strength of these rules can be enhanced if they are supported by national policies and agendas of government agencies. The endorsement and backing by higher authority or external organisations translate into bridging social capital (Pretty and Smith 2003) and gives the group leadership legitimacy in the eyes of the broader community.

5.4.3. Acknowledge trade-offs and enhance values attached to landscapes and species

Developing local institutional arrangements to save habitats contained in landscapes threatened by human development gives rise to the need to acknowledge trade-offs between livelihood and conservation goals (DeFries *et al.* 2007; Dahlberg and Burlando 2009). In this study, trade-offs mainly emanated from the need to curb agricultural encroachment into wetland zones used by cranes while at the same time ensuring there was no resentment among households that were eyeing the unconverted wetland patches for agricultural use. Experiences from the three study sites revealed types of trade-off situations that may be encountered in human-dominated landscapes and lessons on factors that may enhance the acceptability of trade-offs and ways to avoid pitfalls associated with balancing conservation and livelihoods.

As the case studies show, negotiations were necessary to persuade the local communities to accept that some wetland sections would need to remain unconverted for the benefit of cranes. The success of such negotiations depends largely on creating or enhancing socioeconomic values attached to landscapes and resources thereof so that new institutional arrangements are not viewed by households and community groups as causing net livelihood losses by the communities. What makes the experiences from the three case studies complex in the trade-off debate is that they involved species survival, habitat management and sustenance of shared livelihoods in an integrated way. Inherently, conflicts and resentment of the conservation agenda could arise if mechanisms are not put in place to balance conservation and livelihoods. As exemplified by the Nyamuriro case, trade-offs were acknowledged in the sense that there was no blanket eviction of farmers from the wetland but new rules, agreeable to the community, were put in place to curb the further conversion of wetland sections into agricultural plots. In addition, the new wetland management system would make it possible to restore the lost ecosystem service required by most of the community members (papyrus). This was a case of successful management of a trade-off situation. The same cannot be said at Kaku as negotiations to stop households from cultivating in wetland buffers did not yield the desired results.

A high level of community dependence on a shared resource has been reported as a major driver for collective action in the management of that resource (Ostrom 1990; Cox *et al.* 2010). Reversely, communities tend not readily invest much in a resource that is degraded or of low value (Rahman 2012). In such cases, the observation of Imperial and Yandle (2005) becomes relevant, who noted that the process of institutional development should be viewed as sequential and incremental and when communities see change, they may invest more and revitalize the values attached to the resource. Thus, at Nyamuriro for instance, practical actions to restore degraded resources enhanced values attached to them and even enticed community members that had chosen not to be part of the project to join. Ultimately, enhancing collective values of resources may create avenues for community interaction and in the process build social capital as noted earlier.

As noted by DeFries *et al.* 2007 and Hirsch *et al.* 2010, when dealing with trade-offs in conservation, an understanding of social and economic opportunities for achieving environmental impacts without denying local communities' resource use rights. In the three cases at hand, the new institutional arrangements comprised regulations that were meant to, ultimately, maintain buffer width, regulate papyrus off-take and protect crane breeding sites. This highlights the importance of clearly defining the spatial and temporal opportunities for the success of local conservation arrangements, resonating with findings by Rodríguez *et al.* (2006). This also highlights the importance of understanding the interface between ecological science (species and habitat conditions), socioeconomics (financial and material benefits from resource utilisation) and institutions (resource management rules, regulations and policies). Mapping and valuation exercises that integrate data from these three domains are critical. This helps the conservation planner and implementer to identify and deal with pitfalls associated with trade-offs in conservation (Hirsch *et al.* 2010), especially the complex issues such as the size of habitat to trade-off and how to deal with psychological aspects such as user rights and cultural heritage. This calls for the incorporation of ecological standards in defining the spatial and temporal dimensions of trade-offs, particularly species ecological requirements and habitat connectivity (Copeland *et al.* 2007).

In human-dominated landscapes, it takes more than protecting or restoring habitats to ensure the survival of the species targeted for conservation. Even in protected or perfectly restored wetlands, for instance, cranes may be hunted to extinction or fail to breed successfully due to human disturbance. This highlights the need for incorporating species protection aspects when developing

local institutional arrangements. This also implies that fostering non-economic values that aid the survival of the species at all stages of its breeding cycle could complement the positive conservation impacts of habitat protection, as highlighted in the Kaku and Mitooma cases. The success of the custodianship approach at Mitooma and documented cases of communities' conscious avoidance of crane breeding areas was encouraging. However, more could be done to enhance the values that local communities attach to cranes. One avenue to achieve this is to build pride, strengthen interest and secure commitment in saving the species using approaches modelled along the lines of the Rare Pride campaign (Butler 2000; Jenks *et al.* 2010). In the case at hand, the Grey Crowned Crane's status as the national bird of Uganda could be one entry point for promoting their protection locally.

5.4.4. Facilitate convergence of diverse interests for conservation gains

As the stories from the different sites showed when the project started households and community groups had different interests, but all were motivated by the quest to derive livelihoods from wetlands. The project implementers recognised these diverse interests and actions and noted that there was a need to facilitate the convergence of interests using the crane and wetland conservation agenda as the unifying factor. Acknowledgement of diverse interests, motivations and aspirations is known to be a foundational pillar in institutional development for improving natural resource management (Imperial and Yandle 2005; Tai 2007). The findings from the three cases show that the entry points for institutional development varied across sites and so were the ways to secure commitment from households to work individually and collectively towards management of shared wetland resources, infusing the crane conservation agenda in the process.

Understanding a wide range of household and broader community interests can shed light on social ties among households, community power dynamics and broader social networks, a critical consideration in the development of effective and sustainable local institutions (Ruiz-Mallen *et al.* 2015; Alexander *et al.* 2016). The findings from the sites show that normative social influence, evidenced by participation due to initial influence by respected community members and the quest to align with interests of fellow members of pre-existing projects, played a part in nudging community members to join the project. The project provided opportunities for some community leaders to gain new status or influence through their participation in project activities, fulfilling their role as the link between project beneficiaries and local government and political structures (e.g., political leaders at Kaku). Some community members used the project as an avenue to fulfil

pre-existing traditional or social leadership roles, including community organisation, conflict management and resource allocation. The realisation of tangible benefits from conservation action as the project progressed (e.g., improved papyrus at Nyamuriro) was a notable economic motivation. Respect and desire to please the project facilitator, which evolved through regular interaction with him over the years, also motivated some group leaders to strive to ensure project success. The diverse interests, which were managed over the years by the project team, represent psychosocial factors that may help conservation planners to align their agendas with internal motivations for joining projects and support conservation.

Apart from explaining why community members would be willing to be involved in the collective community action, these interests stated above define some of the reasons behind other underlying factors, which may solidify ties, nudge communities to adopt pro-conservation actions and commit themselves to become long-term members of community conservation groups (Brooks *et al.* 2013). Findings from the study demonstrate that though community groups may have shared economic values and interests that a facilitator can easily determine through stakeholder analysis at the beginning of a project, other motivations for partaking in institutional development only become discernible well into the project. Whilst some of the motivations can be taken as strategic entry points for building and strengthening institutions (e.g., social networks and relationships), as was the case in this project, others represent the constraints that militate against the acceptability of institutions (e.g. history of marginalisation of households of lower socioeconomic status) and hidden local political agendas by project participants. Although these constraints were not evident from the stories, they represent some of the inequity and power dynamics issues that the project team needs to be aware of as they may deal with them in future.

The issue of incentives in the form of alternative livelihoods adds complexity to the process of developing and nurturing institutions in communities that have to collaborate if species that move across cadastral boundaries and land units (household-managed plots and commons) are to be conserved effectively. Empirical evidence confirming that provision of household-level economic incentives may improve attitudes towards conservation efforts has been documented (Abbot *et al.* 2001). The study findings give rise to two questions. First, in a donor-facilitated project seeking to improve the management of shared resources, who qualifies to be given start-up inputs? Experiences from the sites show that rolling out the alternative livelihoods could be prone to elite capture, a contentious issue in community development (Platteau 2004). Elite capture creates an unfair advantage whereby individuals that have information about the project, wield socio-political

power and may be close to facilitators benefit from project initiatives at the expense of less endowed households. In this study, households that would incur a loss of utilisation rights due to new institutional arrangements were the sensible targets for compensatory incentives.

The second question relates to ways to ensure that the incentives, given to an individual household or section of the broader community, are provided in such a way that there is individual household and community commitment to behavioural change, translating into positive outcomes of the resource management institutions. The case of custodians at Mitooma provides an interesting point of debate on how to set incentives right given a complex scenario in which sites of conservation importance are managed by individual households. Though in this case, household-based incentives encouraged positive resource use behaviour, it remains to be seen if this arrangement will, over time not derail the desired outcome of collective appreciation and responsibility for the target species. The second issue is the need to build collective responsibility and how to translate household self-interest into an obligation to sustainably manage land to meet desired collaborative management across plot boundaries. This could potentially call for a focused approach to connect custodians, recognising their contribution to shared wetlands and how their efforts translate into sustaining ecosystem services that benefit the community.

5.4.5. Leveraging opportunities and managing bottlenecks rooted in the institutional context

External contextual factors influence the evolution and effectiveness of local institutions in natural resource management (Pomeroy 2001; Brooks *et al.* 2012). These factors include environmental and administrative policy frameworks that provide the basis for stakeholder interaction, at local, district and national levels. This study unearthed a key pertinent factor with a supportive effect on the institutional development, the existence of a national wetlands policy that created a framework for the establishment of wetland management committees and platforms for interaction between wetland users and district administrative authorities. Conversely, we identified three factors that represent bottlenecks to successful institutions, which were the emergence of new socio-economic activities, the disempowerment of communities through the pursuance of self-serving interests and political patronage by the elite and limited technical capacity of government agencies. They also include community development projects that, by their very nature, operate outside the locus of control of community groups and project facilitators.

Despite the mixed results at Kaku and Nyamuriro, the community-based wetland management planning process, rooted in the Uganda Wetlands Policy (1995), provided an enabling framework for enhancing joint problem identification, community participation and dialogue between resource users and project facilitators. Leveraging this government-supported framework for developing grassroots solutions to wetland degradation, taking into consideration the local biophysical context and community interests, was a foundation to deliberate on ways to effectively mitigate the “tragedy of the commons” that could befall large wetlands under common access regimes. This favourable effect of government policies on the design of wetland management institutions was not evident in the policy implementation phase. Decentralisation of wetland management policy was partial as government agencies still have to ratify local plans before they can enter into the sphere of state-based, legally back-up implementation (Rwakakamba 2009; Oosterveer and Van Vliet 2010). This explains why the Wetlands Management Department and the respective district councils, allegedly due to limited technical capacity, did not officially ratify the wetland management plans developed at Kaku and Nyamuriro. At Kaku, this significantly hindered institutional success. At Nyamuriro, the community groups were strong enough to implement its rules without the seal of approval from the government. At Kaku, it appears therefore that institutional success could have been enhanced had it been clear beforehand that government approval and support would not be secured rapidly. Alternatively, institutional development at the site should have focused on empowering on ensuring stronger community groups, without primarily basing the success on the ratification of the plan. Possibly then, for instance, the groups would have developed local mechanisms for regulating the use of wetland resources, including the rise of commercial fishing that threatened local fishing as well as cranes. Reinforcing this possibility is the finding by Kosamu (2017), concerning small-scale fisheries globally and in Malawi, that in cases of weak government enforcement systems (typical in Africa), sustainable natural resource management can be attained without over-relying on government interventions. Overall, the key lesson here is that for community-based conservation, a supportive policy context is only really needed in cases of low social capital at the community level.

5.5. Conclusions and general implications

IAD-based analyses of project experiences at Mitooma and Nyamuriro revealed the efficacy of developing and nurturing local institutions to improve the management of landscapes containing habitats critical for cranes. Discernible species and habitat conservation impacts, attributable to the local institutions developed and sustained over a decade, were identified at the two project sites.

On the other hand, evidence of institutional failure was documented at Kaku. Understanding linkages between institutional interventions and the resultant conservation impacts (or lack thereof) is important for designing or adapting conservation projects in human-dominated landscapes where collective motivations, values and actions by resource users are critical for conservation success.

Project experiences at Mitooma demonstrate that in areas where species targeted for conservation depend on habitats contained within privately-owned land, promoting the concept of species and habitat custodianship can lead to the attainment of the desired conservation outcomes. By adopting custodianship ethics, farmers purposefully adapted their plot management systems, spatially and temporally, to create and maintain suitable breeding habitat conditions for cranes, resulting in improved breeding success, compared to the pre-project outlook. Incentives provided in the form of livelihood projects were a strong motivation for the adoption of positive crane conservation-compatible farming by the custodians. The success of the crane custodianship approach is an actionable lesson for ensuring the long-term survival of cranes on private lands, applicable in other parts of Uganda where cranes are found.

Project experiences at Nyamuriro validate the efficacy of restoring landscapes, using shared ecosystem services (in this case, papyrus and fodder grasses) and pre-existing local institutional structures as entry points to win the support of the local communities. It also highlights that community-based management planning creates platforms for successful institutional development (group formation, interaction forums, collective rules, and collective actions) which can be nurtured for conservation impacts over time. Notable conservation outcomes were registered, including the demarcation of non-agricultural zones, re-introduction of papyrus to wetland buffers, regulation of grass harvesting and reserving patches as reserves for papyrus and fodder grass. Designation of wetland patches into restoration and non-agricultural zones helped maintain suitable breeding habitats for cranes. The approach used at Nyamuriro represents one way in which communities can part and parcel of a solution to address landscape transformation, which has negative implications on crane populations and wetland integrity.

At Kaku, the desired institutional success was not achieved, resulting in wetland encroachment and unregulated utilisation of wetland resources persisting despite project interventions. However, this institutional failure did not have a marked impact on wetland sections used by breeding pairs

and flocks. This was largely due to the isolation sites by cranes from wetland zones used by local communities for their livelihoods. This, coupled with a positive attitudinal change of the community towards cranes, inherently contributed to the protection of breeding pairs and flocks. Developments at the project site show that poor identification of actors or project participants, lack of empowerment of community-based organisations and limited support from government agencies can lead to institutional failure.

Overall, the findings add to the growing evidence of the benefits of grounding conservation planning process in local institutional arrangements, which creates enabling platforms for communities to tackle local threats to species and habitats, while at the same time demonstrating pathways to conservation-compatible livelihoods. This approach, as evidence from the sites shows, enables conservation planners and practitioners to focus on community factors (values, motivations, power relations, social influence, leadership, shared interests) and draw linkages between community actions and associated conservation impacts at site- or landscape level. The influence of external environmental factors (enabling policy, bottlenecks to effective decentralisation, limited financial and human capacity) in community-based conservation is evident from the case studies. In a nutshell, for community-based conservation to be impactful, the process of developing local institutions should be adaptive, allowing both project facilitators and communities to reflect and effectively deal with context-specific challenges and building on successes. This highlights the importance of effective project facilitators and local (site-based) champions.

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