

Slawson Award: Final Report

Win-Win? Balancing people's uses of nature with biodiversity

No Net Loss

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Itanda Rapids in the Kalagala Offset catchment

Abstract

Governments, businesses and lenders worldwide are increasingly adopting a 'No Net Loss' (NNL) objective for nature from a development which typically requires projects to follow a 'mitigation hierarchy' (avoid, minimise, remediate and offset). Offsets aim to balance residual losses of biodiversity caused by development in one location with commensurate gains at another. For offsets to be effective, they need to be designed and implemented to satisfy ecological, economic and social needs. International best practice suggests that offsets should make local people 'no worse off', but there is a lack of clarity concerning how to achieve this with regard to people's use and non-use values for nature, especially given the inevitable trade-offs when compensating biodiversity losses with gains elsewhere. This is particularly challenging for countries such as Uganda, where poor people depend on natural resources; badly planned offsets can exacerbate poverty, and development and offset impacts can vary spatially, temporally, and by location, gender and livelihood. I conceptualise the 'no worse off' principle and propose a definition for determining whether people are 'no worse off, or preferably better off' in the context of biodiversity NNL. I then explore how this principle can be operationalised, using the Bujagali and Isimba Hydropower Projects and the associated Kalagala Offset in Uganda as a case study. My findings highlight the importance of designing NNL strategies that account for the use and non-use values that local people attribute to nature. This will help improve the social acceptability of a combined development and biodiversity offset, and provide insight into how governments, financial institutions and developers can design, implement and maintain equitable and sustainable NNL strategies that protect nature but also leave local people 'no worse off, or preferably better off'.



Victoria Nile River in the study area

1. Description of the project

Introduction

Thirty-one years after the term “sustainable development” emerged from the Brundtland Commission, scientists and practitioners are still searching for practical solutions to reconcile economic development with environmental protection and social fairness. Social fairness in this context is the equitable distribution of benefits and costs of development, and an overall well-functioning society (Gross 2007). Economic development is increasing worldwide and, coupled with human population growth, is increasing existing pressures on the environment and the services it provides for flora, fauna and human communities (Pickett et al. 2013). Development projects, defined as any project deemed necessary to improve the living conditions or future prospects of people in a given area (Ribeiro 2009), create significant economic opportunities, and hence are difficult for any country to relinquish no matter how developed, even if they threaten valuable biodiversity (from genes to populations, species and ecosystems; Virah-Sawmy et al. 2014). The trade-off between economic development and biodiversity conservation can be greatest in economically poor developing countries and regions hosting unique biodiversity (Virah-Sawmy et al. 2014). Consequently, the interface between economic development and conservation is likely to intensify over the next few decades and achieving sustainable economic growth that meets human needs and preserves the environment is a major challenge (Bennett et al. 2017).

Both national legislation and international guidelines exist to guide the design, construction, operation and decommissioning of development projects. Thus, many projects are required to comply with the International Finance Corporation (IFC) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources, which includes a ‘No Net Loss’ (NNL) objective for certain biodiversity components. Simply put, NNL approaches require that impacts on biodiversity caused by an economic development project be quantified and that commensurate gains in biodiversity be achieved through additional conservation actions, in order to demonstrate that gains in biodiversity are equal to, or greater than, the losses incurred from the project (Bull et al. 2013). Achieving a NNL objective typically requires projects to follow a ‘mitigation hierarchy’, often applied in Environmental and

Social Impact Assessment (ESIA) and management planning processes. After evaluating the potential negative environmental impacts of a project, developers seeking NNL of biodiversity follow a hierarchy of measures where they sequentially avoid or minimise impacts wherever possible, then remediate if the impacts are temporary, and finally offset predicted impacts (BBOP 2012). Biodiversity offsetting is therefore the last option to compensate for any residual, unavoidable negative impacts on biodiversity from development projects, either on-site or at an alternative location (Bennett et al. 2017).

Biodiversity offsetting is a contentious approach to environmental management, but if designed and implemented within appropriate habitats and to good practice standards, offers the potential to balance economic development with more responsible environmental and social stewardship (Virah-Sawmy et al. 2014). However, both the use of biodiversity offsetting and the validity of biodiversity NNL continue to be widely debated. In particular, concerns surrounding the technical challenges (Bull et al. 2013; Maron et al. 2016), governance issues (Bull et al. 2013; Maron et al. 2016), ethical aspects (Ives & Bekessy 2015) and lack of evidence of actual effectiveness (Lindenmayer et al. 2017) have been raised. Nevertheless, the last decade has seen an increase in the uptake of NNL targets for biodiversity and, as of 2015, approximately 69 countries had formal national offset policies in place or under development (Maron et al. 2016).

Social impacts of biodiversity No Net Loss

The past years have seen an upsurge in the consideration of social issues associated with NNL strategies and biodiversity offsetting (Maron et al. 2016; Bidaud et al. 2017). Aside from its intrinsic value, people value nature for its use (e.g. consumptive uses and ecosystem services) and non-use (e.g. spiritual, cultural, religious, aesthetic, artistic, educational, scientific, and sense-of-place) values (Pearson 2016). However, whether NNL strategies, including biodiversity offsetting, capture all of the values assigned to nature is questioned (Apostolopoulou & Adams 2015).

Furthermore, losses and gains in nature under NNL strategies can have significant impacts on local people's wellbeing, particularly in low-income countries where people are heavily reliant on natural resources for their daily subsistence (Bidaud et al. 2017). For example, biodiversity offsets could negatively impact local people's wellbeing by restricting their access to natural resources, but may have

a positive impact through creating employment opportunities and eco-tourism (Koh et al. 2014). Offsets can also impact different people to those impacted by biodiversity loss at the original development site, particularly if they are geographically separated. In addition, offsets can affect socio-demographic groups differently. For example, poor or less politically powerful communities or individuals may pay a disproportionate cost for biodiversity conservation as part of an offset, whilst wealthy or more powerful communities or individuals secure benefits (Bidaud et al. 2017). This unequal distribution of costs and benefits associated with gains and losses in nature under NNL strategies can have implications for environmental justice and distributional equity.

Perceptions of inequity and unfairness can undermine the effectiveness and long-term success of a NNL strategy (Maron et al. 2016). Thus, it is vital to include local people in the design and implementation of NNL strategies (procedural equity) whilst also respecting knowledge systems, values, social norms and rights of all local people (recognitional equity; Law et al. 2017). This will help identify what aspects of nature people value and prioritise for their wellbeing, including less tangible values such as nature-based cultural heritage values, which may be overlooked. Methods such as economic nonmarket valuation techniques (e.g. choice experiments) can also play an important role, providing insights into what offset activities people are more likely to prefer and support (Burton et al. 2017).

Trade-offs and the elusive win-win

Over the past few decades, various approaches have been implemented with the aim of conserving biodiversity while simultaneously furthering local social and economic development (McShane et al. 2011). However, evidence (and often hindsight) indicates that trade-offs can and do occur and that initiatives that simultaneously achieve positive economic development outcomes, as well as both conservation of natural resources and improvement of broader wellbeing in the affected areas, appear to be the exception rather than the norm (McShane et al. 2011). Thus, it has been suggested that the belief in 'win-win' situations is misguided (McShane et al. 2011)

Depending on the values that people assign to nature, some trading of different natural elements under NNL strategies may be acceptable, whilst others may not be and could be considered 'taboo' (Bull et

al. 2017). Certain components of nature may be irreplaceable to an individual, household or community and as such, it may not be possible to achieve NNL with respect to the values that people place on nature, rather than the actual nature itself. A new challenge is emerging: to find ways to recognise and accommodate trade-offs that are involved in advancing conservation, economic development and social equity (Daw et al. 2015).

Despite the challenges of achieving 'win-win' solutions, development for national economic benefit should not only strive for NNL of biodiversity but also account for (and compensate for) the multiple social impacts that developments and any associated offsets have on local people, such as affecting people's access to nature. International good practice guidance, such as that produced by the Business and Biodiversity Offsets Programme (BBOP), calls for biodiversity offsets to make local people 'no worse off, or preferably better off' (BBOP 2012). However, there is a lack of clarity concerning how to achieve this with regard to people's use and non-use values for nature, especially given the inevitable trade-offs when compensating biodiversity losses with gains elsewhere.

2. Aims and objectives of my PhD

The overall aim of my research was to explore how people's use and non-use values of nature can be incorporated into the concept of biodiversity NNL. The results provide insight into how governments, financial institutions and developers can design, implement and maintain equitable, socially acceptable and sustainable NNL strategies that protect nature but also leave local people 'no worse off, or preferably better off'. The focus of my research is on the achievement of biodiversity NNL at the individual development project level throughout the mitigation hierarchy as a whole, rather than focusing on biodiversity offsets alone. Using the Bujagali and Isimba Hydropower Projects and associated Kalagala Offset in south-east Uganda as a case study (Figure 1), the main objectives are to:

1. Explore what is meant by leaving local people 'no worse off' within the context of NNL of biodiversity, and to investigate the potential challenges of achieving this alongside biodiversity NNL.
2. Understand local conceptualisations of wellbeing, perceived changes in wellbeing owing to economic development projects, and how development projects seeking NNL of biodiversity can avoid and then minimise their impact on people's wellbeing.

3. Investigate the importance of nature-based cultural values to people's wellbeing, how these values are impacted by economic development projects, and ways these values can be managed and compensated for in project-level NNL strategies.
4. Assess local people's preferences for different proposed compensatory activities as part of a biodiversity offset, with the aim of improving social outcomes of existing, planned offsets.

This research contributed to a new set of international good practice principles aimed at organisations involved in economic development projects seeking to achieve NNL or a net gain (NG) of biodiversity (described further in section 7). The principles bridge the gap between ecological and social aspects of biodiversity NNL and aim to ensure that biodiversity NNL projects generate sustainable and equitable outcomes. Furthermore, Uganda has updated its 1994 National Environment Management Policy (NEMP) and 1995 National Environment Act (informed by the NEMP) to address key gaps in existing policies, such as those pertaining to biodiversity offsetting, payment for ecosystem services (PES) and climate change. This new Environmental Bill is currently before Parliament for approval. At a national level, this research and the good practice principles have been incorporated in the new national Biodiversity and Social Offset Strategy for Uganda, which was published by the Ugandan Government in June 2019. At a local level, the research on social aspects of the Kalagala Offset is complemented by ecological research on the offset. This work is being undertaken by a Ugandan-based NGO, Nature Uganda, and both social and ecological findings have contributed to ongoing policy development for the Bujagali and Isimba Hydropower Projects and the associated Kalagala Offset (described further in section 7).

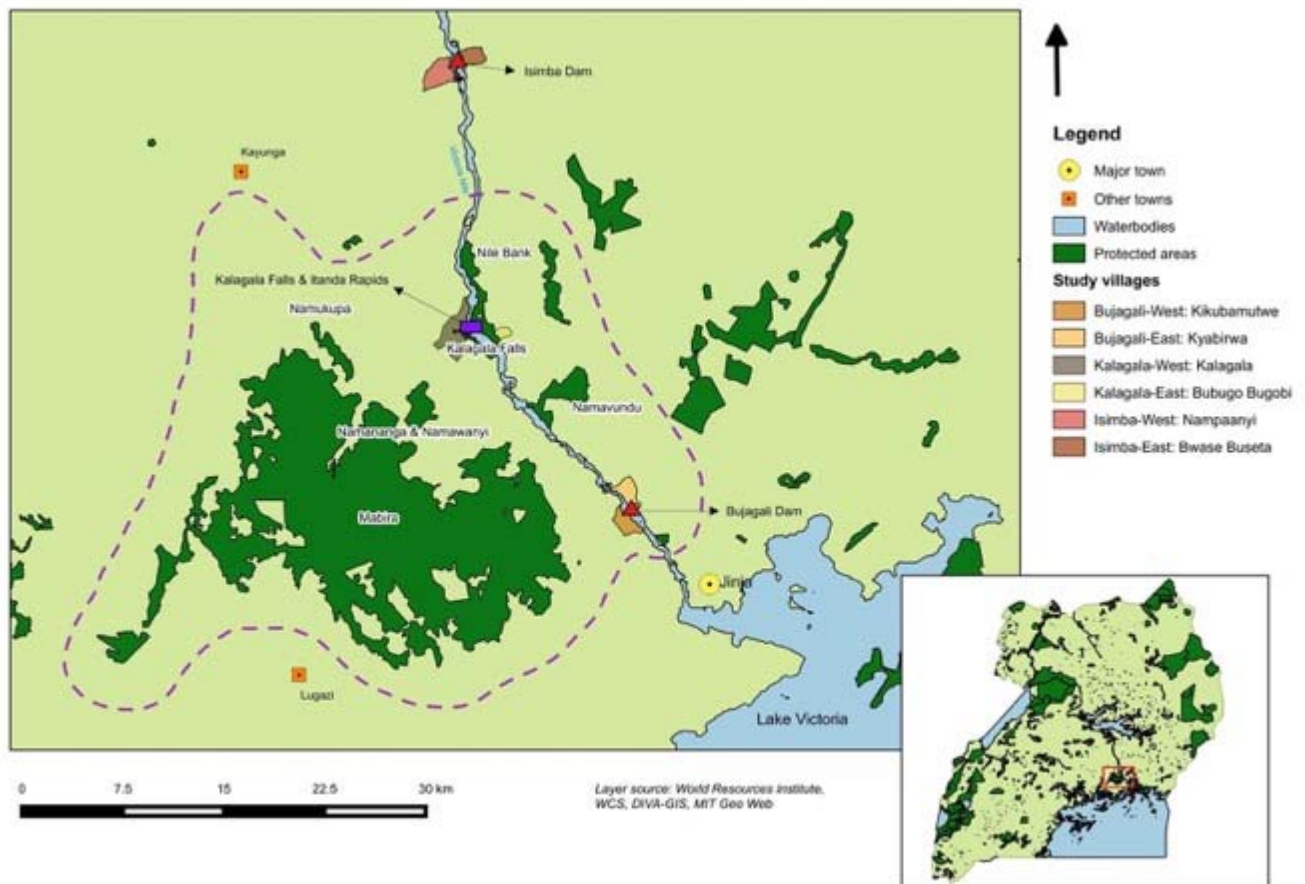


Figure 1: Map of the study site, with the dotted purple outline showing the extent of the Kalagala Offset catchment

3. Research carried out

My research and thesis is divided into four parts: i) background information; ii) conceptualisation of the ‘no worse off’ principle; iii) operationalising the ‘no worse off’ principle using the Bujagali and Isimba Hydropower Projects and the associated Kalagala Offset case study (which the Slawson Award contributed to); and iv) synthesis and application of the research (Figure 2).

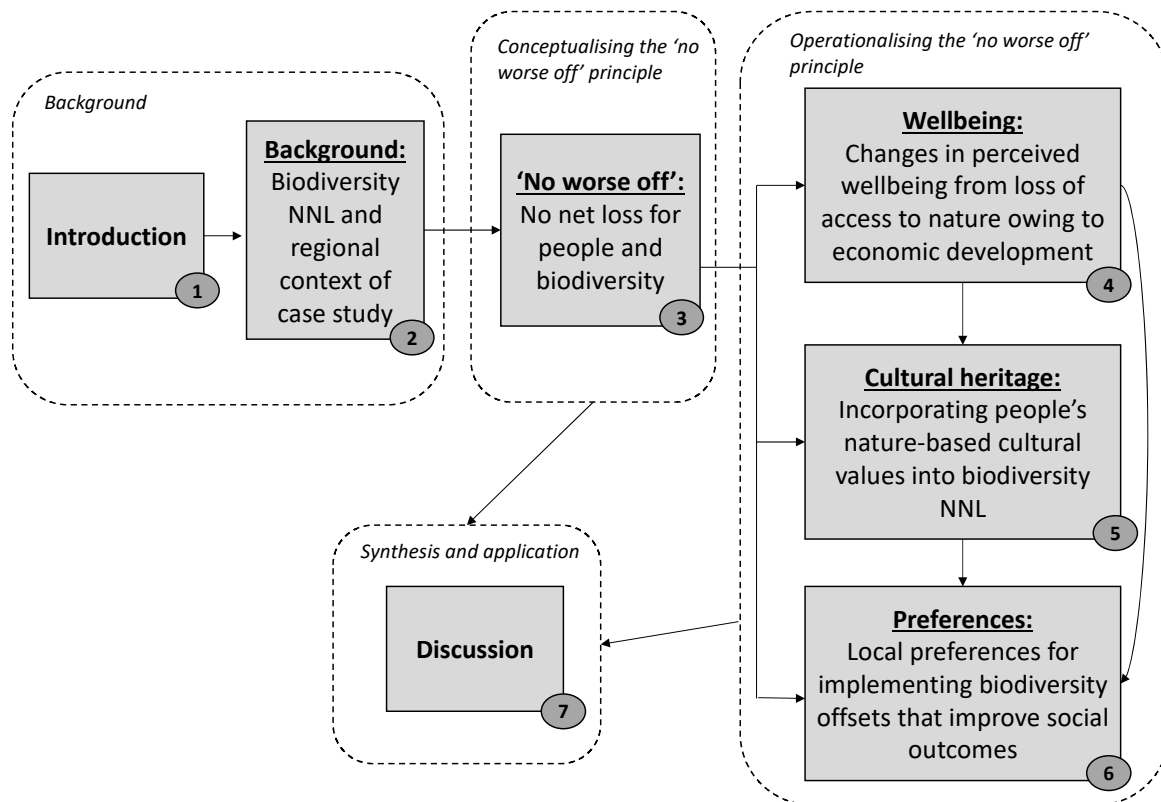


Figure 2: Conceptual framework for my thesis. Boxes represent the main research themes and are numbered by chapter; arrows indicate the logical flow. Dotted lines indicate the four components of my thesis. The term 'no net loss' is abbreviated as 'NNL'. The Slawson Award contributed to the third part: operationalising the 'no worse off' principle using the case study (Chapters 4, 5 and 6)

In addition to a first introductory chapter, my research and thesis comprised a further six chapters and was structured as follows:

Chapter 2:

The first part of Chapter 2 reviews what is meant by NNL of biodiversity, the mitigation hierarchy, biodiversity offsetting, and the advantages and challenges facing NNL strategies and biodiversity offsetting. This is followed by a review of the social impacts arising from economic development projects and NNL strategies, and how these are being measured and managed in practice. The second part of the chapter sets out the contextual background in which my research takes place. The chapter

introduces Uganda and the selected case study used throughout the thesis, namely the Bujagali and Isimba Hydropower Projects on the Victoria Nile River and the Kalagala Offset Project. The chapter concludes with an explanation of why Uganda and this case study were selected and how my research contributes to ongoing biodiversity NNL research in Uganda.

Chapter 3:

This chapter conceptualises the 'no worse off' principle in the context of biodiversity NNL, by addressing three questions: a) no worse off in terms of what? b) no worse off for whom? and c) no worse off compared to what? The evaluation of social gains and losses associated with NNL of biodiversity is explored, followed by a discussion on the spatial and temporal distribution of impacts of a development project and associated offset on local people's biodiversity-related wellbeing. The implications of the level at which these social gains and losses are measured (e.g. individual, household, interest group, village or region) and hence, the degree of aggregation, is also discussed. The chapter concludes by presenting a definition for the 'no worse off' principle: project-affected people (appropriately aggregated) should perceive the component of their wellbeing associated with biodiversity losses and gains to be at least as good as a result of the development project and associated biodiversity offset, throughout the project lifecycle, than if the development had not been implemented.

This chapter has been published in a peer reviewed journal, Conservation Biology. See section 7.

Chapter 4:

Local conceptualisations of wellbeing, perceived changes in wellbeing owing to economic development projects, and how development projects seeking NNL of biodiversity can avoid and then minimise their impact on people's wellbeing.

See section 4 for results.

This chapter is still being drafted for submission to a peer reviewed journal. See section 7. The Slawson Award will be acknowledged as a source of funding in the manuscript.

Chapter 5:

The importance of nature-based cultural values to people's wellbeing, how these values are impacted by economic development projects, and ways these values can be managed and compensated for in NNL strategies.

See section 4 for results.

This chapter has been submitted to a peer reviewed journal, World Development. See section 7. The Slawson Award is acknowledged as a source of funding in the manuscript.

Chapter 6:

Local people's preferences for different proposed compensatory activities as part of a biodiversity offset, with the aim of improving social outcomes of existing, planned offsets.

See section 4 for results.

This chapter has been published in a peer reviewed journal, Biological Conservation. See section 7. The Slawson Award is acknowledged as a source of funding in the manuscript.

Chapter 7:

This final chapter provides a synthesis of my research findings, highlights my key conclusions, reflects on challenges, limitations and opportunities, and explores the implications for environmental management, in particular, biodiversity NNL strategies. The chapter concludes by suggesting directions for future research.

4. Key findings

The sections below summarise the key findings from the three chapters that the Slawson Award contributed to: operationalising the 'no worse off' principle using the case study (Chapters 4, 5 and 6).

Chapter 4: Changes in wellbeing that result from impacts on nature from major infrastructure developments



Fish from the Victoria Nile River, a major livelihood in the study area impacted by the dams

If NNL strategies are to be equitable, socially acceptable and sustainable, local people should be left 'no worse off or preferably better off' in terms of their perceived wellbeing than if the development project had not been implemented (Chapter 3). This is reinforced by moral arguments (e.g. human rights and ethical reasons) to leave people 'no worse off', a practical rationale (e.g. gaining a social licence to operate), and policy or regulatory requirements (e.g. International Finance Corporation (IFC) Performance Standards; BBOP 2012). However, managing and mitigating the impact of biodiversity offsets and NNL strategies on local people's wellbeing, requires a thorough understanding of the magnitude and distribution of the many complex multifaceted social impacts (both positive and negative) associated with losses and gains of biodiversity. One recommendation is to use a human wellbeing framework to evaluate the impacts of NNL strategies on local people (Chapter 3).

Human wellbeing is "a positive physical, social and mental state" and can be thought of as comprising five primary domains: material, health, social relations, security and freedom of choice and action (Woodhouse et al. 2015). Over the past decades, thinking about development and social progress has shifted away from a narrow uni-dimensional focus on wealth and poverty (e.g. income), to a more multi-dimensional holistic evaluation of the human condition, reflecting the importance of social, psychological

and cultural needs required to thrive (Agarwala et al. 2014). Conservation science is increasingly using the concept of human wellbeing as a way of measuring, monitoring and managing the socio-economic and cultural impacts of loss of access to natural resources on local people (Palmer-Fry et al. 2017). This knowledge assists conservation organisations with making informed decisions about the social context in which they operate, leading to the creation of more locally legitimate and socially just management strategies (Woodhouse & McCabe 2018). The learning and experience gained from using human wellbeing frameworks in conservation could be extremely useful if applied to a biodiversity NNL strategies. Measuring impacts on wellbeing will help tease apart the complex, multifaceted social impacts that development projects and NNL strategies might have on local people, thereby providing a deeper form of impact assessment.

In this chapter, I used a human wellbeing framework to evaluate how local people conceptualise a change in their perceived wellbeing as a result of loss of access to nature owing to the Bujagali and Isimba Hydropower Projects and associated Kalagala Offset. I first explored local conceptualisations of wellbeing within a landscape where the development context varies between locations and, second, how local people perceive changes in their wellbeing as a result of the effects of an infrastructure project on their natural surroundings. I sampled six villages along the Victoria Nile River, experiencing different levels of hydropower development (see Figure 1 above). Two study villages are adjacent to the 250MW Bujagali Hydropower Project (approximately 8km north of the town of Jinja), where construction was completed in 2012. Another two are located north of Bujagali within the Kalagala Offset catchment, where no development is occurring but where biodiversity offset activities associated with the Bujagali dam are located. The final two villages are located adjacent to the Isimba Hydropower Project, about 40km north of Bujagali, where construction was underway at the time of the study. The study area is densely populated and cultivated, poverty is widespread and local communities are reliant on the river and its adjacent biodiversity for their livelihoods (fishing, medicinal herbs, sand mining, local tourism activities, and papyrus and palm leaves for arts and crafts). Subsistence agriculture (for household consumption and retail) is the main livelihood activity in the area. Several Central Forest Reserves (CFRs) (protected forest or woodland areas) occur in close proximity to the river, as well as a large CFR about 20km to the west (Mabira). However, many of them are highly degraded, with local communities using their natural resources for fuelwood, medicinal herbs and agriculture.

Qualitative and quantitative data were collected during two trips to the study area – a scoping trip in April to May 2016 and a second trip from September 2016 to February 2017. Four focus groups were undertaken in each village, with participants aggregated according to their gender and livelihood strategy, to understand livelihoods and uses of natural resources in the study area, and to explore the perceived impacts of the hydropower dams on livelihoods and natural resource use. A further four focus groups (with the same groupings but different participants) were carried out in each village to explore participants' perceived impacts of the hydropower dams on their wellbeing. I also carried out surveys in the form of an individual questionnaire in all six villages, collecting general socio-demographic data (e.g. gender, education level, age, primary livelihood and length of time lived in the village), personal conceptualisations of wellbeing (respondents were asked “for yourself, what does it mean to lead a good life?”, and were able to free-list factors, elucidating the important components of wellbeing for individuals in the villages) and several other questions about whether (and how) they felt that the hydropower dams had affected their perceived wellbeing.

A total of 1305 respondents were interviewed (490 individuals from 317 households at Bujagali, 489 individuals from 289 households at Kalagala and 326 individuals from 178 households at Isimba). Villages at Bujagali and Kalagala were larger than those at Isimba, so to maintain a consistent proportion of individuals sampled per village, more individuals were sampled in the four villages at Bujagali and Kalagala. Where possible, the household head and another family member were interviewed at the respondent's home to capture intra-household variation, particularly by gender and age. Four local enumerators undertook the questionnaire interviews in either Luganda or Lusoga (the local dialects). They also assisted with the focus groups.

Results found that local people in the study area prioritised the material domain of wellbeing; of the five wellbeing domains (material, health, social relations, security and freedom of choice), the material domain was most frequently mentioned by respondents in all six villages, with food, employment and income and shelter being the three most important wellbeing components (Table 1). Respondents highlighted food and a balanced diet as being particularly important to their wellbeing. For example, having enough food provides people with energy to work and farm, cultivate their own food, earn an income (e.g. to buy protein), and provide their families with the basic necessities. The health domain was the second most important domain to people's wellbeing in the study area, with feeling healthy and

strong being the most important wellbeing component in this domain, followed by access to healthcare services. The social relations and security domains were mentioned less often. Therefore, the results suggest that the material and health wellbeing domains and, in particular, the ability to produce enough food for one's family, would be particularly important to consider when thinking about how a development project (the dams, in this case) might affect people's wellbeing in this area.

Table 1: Top ten frequently mentioned wellbeing components during the individual questionnaire survey

| Wellbeing domain | Component named | Frequency mentioned in sample (%) |
|-------------------------|------------------------------------|--|
| Material | Food | 56 |
| Material | Employment and income | 43 |
| Material | Shelter | 29 |
| Material | Basic necessities on the BN list | 20 |
| Material | Clothing | 26 |
| Health | Feeling healthy and strong | 19 |
| Health | Health services | 31 |
| Material | Access to water | 14 |
| Material | Education services | 22 |
| Material | Land for homestead and agriculture | 11 |

Heterogeneity in wellbeing conceptualisations and prioritisations was also observed in the study area. For example, women tended to focus more on the relational aspects of their lives than men when discussing wellbeing. In particular, heterogeneity was found across geographies and locations experiencing different degrees of economic development. This has significant implications for landscape level conservation and development plans. The importance of components in the health and social relations domain decreased downstream, further away from the town of Jinja. Villages become more rural and isolated the further downstream one travels, with fewer NGOs operating in these villages and services being more limited. In addition, the villages furthest downstream (at Isimba) were the poorest of the six villages. Thus, people in these villages may be more concerned with the material components required to live a good life.

When measuring impacts on wellbeing, decisions need to be made about the appropriate aggregation unit to use (i.e. individual, household, sub-group, village or landscape) and an understanding of the dynamics of the social systems is vital to ensure that the choice of aggregation groups aims to deliver equitable outcomes. Disaggregation into increasingly smaller sub-groups enables a better, more accurate, understanding of how biodiversity NNL activities affect different groups of people's wellbeing, particularly marginalised and vulnerable groups. However, this may not always be feasible owing to time and budgetary constraints. However, the geographical heterogeneity indicates that it may not be appropriate to measure the impacts of biodiversity NNL on wellbeing at a landscape level (aggregating by villages), thereby generalising the results across the region. Instead, the six villages in this study fell into three groups, categorised by their remoteness from the urban centre.

In terms of evaluating the impact of the hydropower projects on people's wellbeing, respondents were asked if they were angry, sad or happy about the dams and why (Table 2). Investigating these perceived impacts on wellbeing (using questions that target the different wellbeing domains), and identifying which components are important to people's wellbeing and why they are prioritised, allows for a deeper understanding of what effect development and biodiversity NNL strategies could have on people's lives, than general Environmental and Social Impact Assessment (ESIA) methods. Detailed discussions in the case study area helped uncover some perceived impacts from development that might not have been considered in traditional impact assessments such as ESIA. For example, people's perception that rock blasting had greatly affected their lives was apparent, based on the number of times it was mentioned. One of the more obvious reasons was that people perceived rock blasting to have caused cracks in their houses. However, discussions revealed more troubling reasons behind the negative impacts of rock blasting that might not have been considered without consultations. People in the study area perceived rock blasting to be the cause of miscarriages in both women and livestock, as well as health problems (e.g. high blood pressure, heart attacks and deafness) and even deaths amongst people and livestock. Therefore, local beliefs about how a development project affects people need to be taken into account when designing compensation schemes and management measures in an attempt to compensate (or better, dispel or remediate) negative perceptions and attitudes towards a development project.

Table 2: Top ten reasons why people feel angry (n = 84), sad (n = 327) or happy (n = 556) about the dam's construction in the study area

| Wellbeing domain | Component named | Frequency (%) |
|-------------------------|---|----------------------|
| Angry | | |
| Material | Lost livelihoods / source of income | 40 |
| Material | Lost land to the dam | 40 |
| Material | Lost access to natural resources (e.g. fish, fuelwood, medicinal herbs, papyrus etc.) | 39 |
| Material | Loss of tourism | 33 |
| Material | Rock blasting damaging houses | 30 |
| Material | Compensation received was too little / unfair | 24 |
| Social relations | Cultural heritage has been destroyed | 18 |
| Material | Deforestation leading to drought and climate change | 15 |
| Material | Nature has been destroyed | 15 |
| Material | Promised services were never delivered | 14 |
| Sad | | |
| Material | Lost land to the dam | 35 |
| Material | Rock blasting damaged houses | 34 |
| Material | Lost livelihoods / source of income | 25 |
| Material | Lost access to natural resources (e.g. fish, fuelwood, medicinal herbs, papyrus etc.) | 20 |
| Material | Loss of tourism | 19 |
| Health | Rock blasting affected people's health | 15 |
| Material | Electricity is not free / rates are too high | 11 |
| Material | Deforestation leading to drought and climate change | 10 |
| Health | Rock blasting affecting livestock's health | 9 |
| Happy | | |
| Material | Provided electricity | 37 |
| Material | Employment opportunities | 22 |
| Material | Development for the region and village | 20 |
| Material | Going to provide electricity | 19 |
| Material | Improvement of services in the village | 17 |
| Material | Development for the country | 8 |

| Wellbeing domain | Component named | Frequency (%) |
|-------------------------|----------------------------------|----------------------|
| Material | Establishment of factories | 4 |
| Material | Able to build new, modern houses | 4 |
| Material | Compensation received | 4 |

These results reveal which wellbeing components are of particular value and prioritised by people in a rural landscape where different areas are experiencing different effects from an infrastructure project. They further indicate what people perceive to be the most important impacts (both positive and negative) on their wellbeing as a result of hydropower development, either eroding or enhancing their support for the project. Many of the perceived positive and negative impacts were similar across the two development sites (Bujagali and Isimba) and will not be unique to these projects. They will, however, be specific to low-income countries, such as Uganda, with high levels of poverty and where a large proportion of the population relies on natural resources for their livelihoods.

In conclusion, evaluating a development project and NNL strategy's impact on biodiversity and the associated repercussions for the human wellbeing domains is important, as it provides a more rounded and nuanced understanding of the local context in which an intervention takes place (Palmer-Fry et al. 2017). Furthermore, it can help enhance the visibility of intangible cultural values and provide a better understanding of their spatial and temporal dynamics. This knowledge is particularly important since the success of interventions (including NNL strategies) is dependent on understanding the priorities and incentives of local people (Beauchamp et al. 2018). Therefore, in order to have a more holistic understanding of people's relationship with nature, and to capture all nature-based values that might be affected by NNL strategies, qualitative techniques, in conjunction with economic assessments, are needed. Understanding people's wellbeing priorities, and how they vary geographically and between socio-demographic groups, will help in identifying a wide range of positive and negative impacts, including some of the subtler impacts, that local people experience from NNL strategies. This will help developers and practitioners design and implement more equitable, sustainable and effective project-level biodiversity NNL strategies.

Chapter 5: Incorporating local cultural connections to nature into biodiversity

NNL strategies



Sacred cave in the study area

Losses and gains in nature under NNL strategies can significantly impact people both positively and negatively, at both the development and offset sites, often affecting nature's provision of cultural values. However, there is a lack of empirical research on how to incorporate people's cultural values associated with nature into NNL strategies, respecting the inherent complexity, context-specificity and place-based nature of people's relationships to their cultural heritage.

Culture encompasses a range of use and non-use values, some of which have little to do with nature (e.g. those associated with historic buildings), whilst others (e.g. associated with natural areas and use of wild products) are inextricably linked to it (Daniel et al. 2012). Human societies have been interacting with their environments for thousands of generations, resulting in human cultures shaping, and being shaped, by nature (MA 2005). This inherent, mutualistic relationship between nature and culture has led people to protect (or degrade) culturally important species, habitats and landscapes (Holmes et al. 2018), has shaped individual and collective cultural identities (Stephenson 2008), and influenced knowledge, belief systems and traditional practices (Pretty 2009). Heritage values, cultural identity, knowledge systems, religions, social interactions and other amenity services (e.g. aesthetic enjoyment, recreation, artistic and spiritual fulfilment, and intellectual development) all contribute to an individual's quality of life and general wellbeing (Schneider 2018).

Understanding cultural beliefs, appreciating different worldviews, and recognising the ways in which different cultures interact with and value nature, is essential if conservation initiatives are to be successful (Infield & Mugisha 2013). Apart from an ethical standpoint, focusing on people's nature-based cultural values can help justify and motivate conservation initiatives (including NNL strategies) that are not only meaningful to different groups of people but also align with communities' own conservation priorities, respecting the rights of local and indigenous communities (Infield et al. 2018). This is a powerful means of building community support for conservation whilst also creating partnerships between conservation agencies and local communities (Infield et al. 2018). Considering nature-based cultural values can therefore enhance the equity, efficacy and social acceptability of conservation efforts, including NNL strategies such as biodiversity offsets.

The previous chapter identified that the hydropower projects had significant impacts on cultural heritage in the study area, thereby negatively affecting local people's wellbeing. Given the importance of cultural heritage in the study area, I explored the challenges of incorporating people's nature-based cultural values into NNL design for development projects. I explored people's perceptions concerning how important cultural heritage in general is to their wellbeing and evaluated the perceived impacts of the hydropower projects on cultural heritage. In the study area, spiritual practices are associated with an ecological feature (e.g. river rapids and waterfalls, caves, trees and stones), each of which has a resident spirit that is worshipped by a particular community.

I sampled the same six villages and individuals from Chapter 4 (from September 2016 to February 2017), using the same questionnaire to collect data on cultural heritage. This was complimented by in-depth focus group discussions (four per village), with participants aggregated according to their gender and livelihood strategy, to encourage participants to talk freely.

I found that three themes were frequently mentioned during the focus groups when respondents were asked to describe cultural heritage:

- i) Spiritual beliefs, rituals and ceremonies. This encompasses many elements of cultural heritage, such as myths and stories, rituals, mainstream religion and spirits, that can be considered 'intangible' by Western cultures.

- ii) Nature and sacred sites. Sacred sites are usually in the form of natural environmental features (e.g. ranging from forests, trees, caves, lakes, rivers, waterfalls and mountains to entire landscapes). Several floral species in the area have medicinal properties, used to treat illnesses such as malaria, headaches, stomach problems, wounds and burns. Some plant and animal species represent totems and are therefore protected. Bark cloth, a traditional fabric with ritual significance is made from the internal bark of a local *ficus* tree.
- iii) How cultural heritage is changing. Many respondents felt that cultural heritage and traditions have changed for the worse, becoming less important to their communities over time. The main reasons for this change were: the influence of mainstream religion, western culture and modernity, spirits, sacred sites, loss of medicinal herbs, development projects (especially the hydropower dams), changes in access to natural resources, climate change and the commercialisation of cultural heritage.

Based on my results, I found people in an area affected by economic development projects perceived cultural heritage to be an important component of their wellbeing:

“Cultural heritage is a person’s identity. You need a few other things to supplement one towards living a good life”.

(Bujagali Village, men’s focus group)

However, this importance was not homogenous; variation was both geographical and socio-demographic. Men and the less poor found it to be very important, whilst people who had lived in the village for a short time and who had higher education levels found it less important. Respondents in villages where sacred sites are well-known or still intact described cultural heritage as being an important factor contributing to wellbeing.

When exploring the impact of the dams on cultural heritage and whether this impact can be compensated, respondents complained that rock blasting activities (associated with both Bujagali and Isimba dams) disturbed the spirits at these sites, causing them to migrate or ‘wander’ around the village disturbing people. Most respondents (both men and women) specified that compensation for lost sacred sites is possible, provided the correct procedures are followed to consult with and relocate the spirits. Comprehensive engagement is necessary not only between developers and spiritual leaders, but also

with the broader community in order to understand (as far as possible) the values attached to the impacted sacred site. Discussions and negotiations can then follow between all interested and affected parties to decide on the relocation procedure, agree on a new location for the sacred sites that is mutually acceptable (e.g. minimising travel distance), whilst at the same time, respecting local people's beliefs and traditions. Further, spirits are 'site-specific', meaning that some need places with water and waterfalls whilst others need land with trees and stones. Thus, water spirits cannot be relocated to land. Spirits are also unique, so one cannot compensate for the loss of a sacred site and spirit in one area (e.g. Bujagali or Isimba) by protecting one at another site (e.g. Kalagala).

Transfer ceremonies were carried out to relocate the spirits at Bujagali to a new site, however no relocation of the spirits occurred at Isimba. As such, people near Isimba believed that the spirits are angry as they have not been relocated or compensated and that this is one of the reasons behind miscarriages and unexplained deaths in their village. Respondents also said that people now have to travel great distances to visit other sacred sites, but they are not the same as the ones lost.

"The dam has destroyed waterfalls which used to habit the spirits. The dam also destroyed all the trees where spirits used to live and the rock blasting activity chased away the spirits".

(Isimba village: women's focus group)

National economic benefits often out-compete local spiritual values within the decision-making process for development projects. This may be a combination of the wish to exploit new markets, the need for economic development and 'modernisation' making spiritual values less salient to decision-makers. This case study is an example of a trade-off between nationally significant economic development projects and local people's nature-based cultural values. The need to increase power generation within Uganda has been identified as a priority for the country. However, to maximise hydropower potential, dams are built which inundate waterfalls and rapids, many of which have spiritual value to local people. Hydropower development, and hence impacts on culturally important natural sites, is often deemed unavoidable, not only in Uganda but worldwide.

Once the cultural impacts (and who experiences these impacts) have been fully understood, the mitigation hierarchy can be applied to impacts on both nature and cultural heritage. If the first two preventative steps (avoidance and minimisation) are unachievable fully or in-part, trade-offs could exist.

At the last stage of the mitigation hierarchy (offset), a key decision is how to compensate people when a development project affects their nature-based cultural values, with the aim to ensure that they are 'no worse off'. However, it is vital to recognise that it may not always be possible to fully compensate people for negative cultural heritage impacts incurred from either a development or its associated offset, owing to the high irreplaceability of certain components for affected people (e.g. if spiritual sites are damaged, destroyed or rendered inaccessible (BBOP 2012)). In these instances, it must be recognised that the outcomes of a development and its associated offset for people cannot be sustainable or equitable, even if biodiversity NNL is achieved.

“Once the spiritual site is demolished, it will be the end and it cannot be gotten back”.

(Kalagala village: men’s focus group)

The study highlights the complex relationships between cultural heritage, nature and people’s wellbeing, and how essential it is to understand and account for cultural heritage when planning developments and associated offsets, if they are to be sustainable and fair to local people. Irreplaceability of some natural features of high cultural or spiritual significance means that compensation for impacts may not always be feasible and trade-offs will occur. Thus, understanding and considering cultural beliefs will assist with designing more equitable NNL strategies that leave local people 'no worse off'.

Chapter 6: Local people's preferences for biodiversity offsets to achieve 'no net loss' for economic developments



Conducting an interview with a respondent

Understanding people's preferences for biodiversity offsetting activities can help to design offsets that achieve NNL of biodiversity while incorporating the use and cultural values associated with this biodiversity. Perceptions of equity influence people's attitudes towards, and acceptance of, conservation activities (including offsets), impacting their long-term sustainability (Sommerville et al. 2010). Understanding local people's preferences early in offset design can therefore: a) ensure that decisions are appropriate for the local social-cultural and environmental contexts; b) encourage ownership; c) build trust and reduce conflict; and d) reduce implementation costs (Sterling et al. 2017). Overall, this helps in designing NNL strategies that both meet conservation objectives and leave local people 'no worse off' in terms of their perceived wellbeing.

In this chapter, I used a stated preference choice experiment (CE) to solicit local people's preferences for different proposed compensatory activities as part of a biodiversity offset, linked to the two hydropower developments, with the aim of improving social outcomes of planned offsets. Specifically, I explored what compensatory actions people who are immediately dependent on natural resources prefer as part of a biodiversity offset and whether these preferences differ geographically and between socio-demographic groups. Quantifying preferences using economic nonmarket valuation techniques

such as CEs is useful as it can provide important insights into what activities and policies people prefer and are more likely to support (Burton et al. 2017). I surveyed the same respondents in the same six villages used for Chapters 4 and 5 (from September 2016 to February 2017), and the CE was carried out at the end of the questionnaire. As part of the CE, respondents were presented with different combinations of offset activities, and asked to choose their most preferred offset activity and associated social benefit (Table 3).

Table 3: Offset activities and their social benefits

| Offset activity | Different options to choose from |
|---|---|
| <p>Sustainable livelihood schemes</p> <p>Environmentally friendly business enterprises such as bee keeping and horticulture will be established that will help enhance household incomes. There will also be support for the planting of high value trees such as fruit trees on participants' land. Seedlings and technical support will be provided to farmers to plant these trees on their land.</p> <p>Any household in the village would be allowed to participate in the scheme provided they are committed to the implementation of the enterprise as per specified terms and conditions, one of which would be that the participants stop cutting down trees in the CFRs. If there is evidence of a participant cutting down trees in the CRF, the participants' household will be excluded from the scheme for a year.</p> | <p>1. No scheme implemented</p> |
| | <p>2. Scheme implemented, participants earn UGX (Ugandan Shillings) 500 000 / year</p> |
| | <p>3. Scheme implemented, participants earn UGX 1 000 000 / year</p> |
| <p>Monitoring and evaluation employment</p> <p>Residents in the villages located in the Kalagala offset and close to the CFRs will be employed by the Government to assist with monitoring and evaluating the status of the CFRs. People employed will earn 200 000 UGX per month and the jobs will last for 5 years.</p> <p>Employment opportunities will be spread evenly across the villages to ensure that people employed are not all from one village.</p> | <p>1. No employment to local residents</p> |
| | <p>2. 70 people employed (about one person from each village surrounding the CFRs)</p> |
| | <p>3. 140 people employed (about two people from each village surrounding the CFRs)</p> |

| | |
|---|---|
| <p>Tourism revenue-sharing and sustainable investment</p> <p>Rafting companies will benefit from the protection and maintenance of the Kalagala Falls and Rapids, as well as the tourism development activities undertaken as part of the Kalagala Offset.</p> <p>With this activity, a proportion of the tourism revenue derived from the river rafting permits will be earmarked for either the restoration and management of the CFRs or community development in villages located within the Kalagala offset (including those located near the Bujagali and Isimba dams).</p> | <ol style="list-style-type: none"> 1. There is no money paid to the fund from a proportion of each tourist river rafting permit. This means that no money from rafting will be used for either community development or management and restoration of the CFRs. 2. USD 3 / 10 000 UGX per tourist river rafting permit is paid into the fund, which adds up to about 3 000 USD / 10 000 000 UGX per year. This money will be earmarked for management and restoration of the CFRs. 3. USD 3 / 10 000 UGX per tourist river rafting permit is paid into the fund, which adds up to about 3 000 USD / 10 000 000 UGX per year. This money will be earmarked for community development in the villages. |
| <p>Native tree planting programme and alien tree removal in the CFRs</p> <p>Paper Mulberry trees are an invasive species and despite being useful to local people, they damage the environment by taking space and water from native trees, and are less good as homes for wildlife like birds. Village residents will be employed to remove these trees from the CFRs. Once the aliens have been cleared, native tree seedlings will be planted.</p> <p>Residents from villages in the Kalagala offset area will be employed to remove alien trees and plant the seedlings. They will also be employed for a further two years to assist with the maintenance of the new seedlings.</p> | <ol style="list-style-type: none"> 1. Clearing alien trees and planting of new indigenous trees 2. Clearing of alien trees in the CFR only 3. Planting of native trees in the CRF only 4. No tree planting and alien tree clearing in the CFR |
| <p>Access to spiritual sites at the Kalagala Falls and Itanda Rapids</p> <p>At present, village members near the Kalagala Falls and Itanda Rapids are allowed to visit the spiritual sites for free whilst visitors to the area pay UGX 1 000 to visit the sites. This money goes to local community organisations that provide guides to tourists.</p> | <ol style="list-style-type: none"> 1. Free access to community members and a fee of UGX 1 000 to be paid by visitors (mixed payment). Money used for guides. 2. Everyone (including outsiders and community members) will need to pay. Visitors will pay UXG 1 000 to visit the spiritual site whilst community members will pay UGX 500. Extra money used to improve the site for everyone. |

| | |
|--|---|
| <p>As part of this offset activity, the money charged to tourists to visit the site will be used to pay the guides and any extra money will be used to improve the site for everyone by ensuring that the sacred sites are protected, maintained and kept clean. The money could also be used to improve existing facilities like the gazebo as well as construct new facilities like toilets.</p> | <p>3. Free access to everyone (including outsiders and community members). No money for guides or improving the site.</p> |
|--|---|

Overall, people preferred offsets and compensatory activities that provide social benefits to the entire village (e.g. tourism revenue sharing) rather than just a few individuals (e.g. employment). Tourism revenue-sharing was most preferred activity, with revenues invested in community development; this was sometimes twice as preferred as the next activity. The next two most-preferred activities involve improving the degraded CFRs in the study area, either through directing revenue-sharing to CFR management or a tree planting/clearance scheme. If people in the study area can continue to access the CFRs as part of the offset (albeit with restrictions), they may benefit considerably from their restoration and maintenance. In addition, communities recognised the non-financial benefits of forests, and in particular, their importance in rainfall formation. Provisioning of natural resources and climate regulation may explain why respondents opposed the removal of alien trees in the CFRs. Alien species (e.g. Paper Mulberry and Eucalyptus) are fast growing and valuable sources of timber and fuelwood. It must be noted, however, that this could create a conflict between achieving NNL for biodiversity (e.g. removal of alien species) and ensuring local people are ‘no worse off’ when people use and value alien trees.

Following revenue-sharing and tree planting/clearance, respondents preferred for people to pay to access spiritual sites, with some having negative attitudes towards free access. Respondents’ choices were influenced by gender, age, education level, length of time lived in the village, level of poverty, and whether they believed that the hydropower development had affected their wellbeing. Preferences also varied significantly between villages. These findings provide insight into locally preferred options for biodiversity NNL offsets and compensatory activities. They also demonstrate the use of CE’s to inform decisions about biodiversity offsets, as part of ensuring that NNL strategies do not make local people worse off.

5. Final budget

Table 4: Budget

| Item | Cost | Comment |
|-----------------------------------|---------------|---|
| Return flight to Uganda | 704 | |
| Accommodation in Jinja | 231 | 30 nights |
| Research assistants salary Week 1 | 288 | 4 research assistants, £ 72 per week each |
| Research assistants salary Week 2 | 288 | 4 research assistants, £ 72 per week each |
| Research assistants salary Week 3 | 288 | 4 research assistants, £ 72 per week each |
| Research assistants salary Week 4 | 288 | 4 research assistants, £ 72 per week each |
| TOTAL | £ 2087 | |

4. Presentations

My research findings have been widely disseminated through presentations at international conferences, workshops and meetings held in the U.K. and Uganda, and meetings held with the local communities that I sampled during my data collection. Audiences include a range of international stakeholders: U.K. and Ugandan government agencies, academics, NGOs, businesses, consultants and local communities in Uganda.

International conferences:

- [ICCB 2017](#): The International Congress for Conservation Biology, in Cartagena, Colombia. July 2017. Title of talk: No Net Loss for people and biodiversity (presentation of Chapter 3, conceptualising the 'no worse off principle').
- [IAIA 2018](#): The International Association for Impact Assessment Conference in Durban, South Africa. May 2018. Title of talk: No Net Loss for people and biodiversity (presentation of Chapter 6, choice experiments).

- [IAIA 2019](#): The International Association for Impact Assessment Conference in Brisbane, Australia. May 2019. Title of talk: Including cultural values into biodiversity No Net Loss (presentation of Chapter 5, cultural heritage).
- [ICCB 2019](#): The International Congress for Conservation Biology, in Kuala Lumpur, Malaysia. July 2019. Title of talk: Including cultural values into biodiversity No Net Loss (presentation of Chapter 5, cultural heritage).



Presenting at IAIA 2019

All presentations acknowledged the Slawson Award as a source of funding.

Workshops:

I have also been invited to present my results at a variety of meetings and workshops in both the U.K. and Uganda, including, but not limited to:

- A meeting with [The Biodiversity Consultancy](#) in Cambridge (February 2018).
- A workshop with NGOs and businesses in Cambridge (February 2018).
- A SNAPP ([Science for Nature and People Partnership](#)) workshop on [Compensatory Conservation](#) in Uganda (March 2018).
- Two formal research workshops in Uganda (March 2018).
- A symposium held at the University of Oxford (November 2018).

All presentations acknowledged the Slawson Award as a source of funding.

Local consultation and dissemination of results:

Local consultation and dissemination of my research findings to local government, village leaders, Local Council Chairmen (LC1) and representatives took place on two occasions. As part of a wider project (separate from my PhD), we collaborated with a leading Ugandan based NGO, Nature Uganda, who were responsible for evaluating the impacts of the Bujagali and Isimba Hydropower Projects and the Kalagala Offset on biodiversity (flora and birds) in the study area. This complimented my work on the social impacts associated with the two dams and offset. In March 2018, Nature Uganda and I visited the six villages that I sampled during my data collection and presented our preliminary findings on the biodiversity and social assessments. Our meetings were held in the Luganda or Lusoga (the local languages), depending on the village location and we used visual aids in the form of posters in both English and Luganda. As only the preliminary results were presented in March 2018, Nature Uganda carried out a second and final round of dissemination in the study area in March 2019 to present the final results from the social and biodiversity studies.



Village dissemination meeting

5. Publications and other outputs (links included where applicable)

Academic publications:

- [Griffiths, V. F., Bull, J. W., Baker, J. and Milner-Gulland, E.J. 2019. No net loss for people and biodiversity. Conservation Biology 33\(1\):76-87. \(Chapter 3\)](#)
- [Griffiths, V. F., Sheremet, O., Hanley, N., Baker, J., Bull, J. W. and Milner-Gulland, E.J. 2019. Local people's preferences for biodiversity offsets to achieve 'no net loss' for economic developments. Biological Conservation 236:162-170. \(Chapter 6\)](#)

Academic publications under review or in draft:

- Griffiths, V. F., Bull, J. W., Baker, J., Infield, M., Roe, D., Nalwanga, D., Byaruhanga, A., and Milner-Gulland, E.J. Incorporating local cultural connections to nature into biodiversity No Net Loss strategies. World Development, submitted in June 2019. (Chapter 5). The Slawson award is acknowledged as a source of funding in this manuscript.
- Griffiths, V. F., Baker, J., Bull, J. W., Roe, D., Nalwanga, D., Byaruhanga, A., and Milner-Gulland, E.J. Changes in wellbeing that result from impacts on nature from major infrastructure developments. Manuscript currently being drafted. (Chapter 4). The Slawson award will be acknowledged as a source of funding in this manuscript.
- PhD thesis compiled by Victoria Griffiths (OU): “Win-win? Balancing people’s uses of nature with biodiversity No Net Loss”. I am currently addressing comments from my two examiners and will make the thesis publicly available by the end of 2019, once the corrections have been approved. The Slawson award is acknowledged as a source of funding.

Other outputs:

The research that I carried out on the hydropower projects and Kalagala Offset as part of my PhD helped inform two additional outputs.

1. Social good practice principles

A set of international good practice principles for incorporating social considerations into biodiversity NNL activities and biodiversity offsets has been drafted and published. These principles are for those involved with economic development projects who are applying the mitigation hierarchy to achieve NNL of biodiversity. This includes development commissioners and investors, consultants, statutory bodies, regulators, competent authorities, auditors, contractors, academics and policy makers, among others. They clearly set out good practice principles for development projects to achieve NNL of biodiversity, while addressing the negative effects on local people and maximising opportunities for NNL to generate positive social outcomes, thereby setting an ambition which industry, investors and industry can strive to achieve. The principles closely align with existing best practice guidance on NNL of biodiversity, ensuring that people’s use and cultural values associated with biodiversity are taken into account when designing and implementing NNL projects. These principles represent a change in thinking, promoting

NNL strategies that aid poverty alleviation and help improve outcomes for local people, especially the rural poor who rely on biodiversity for their livelihoods. In addition, through collaborating with partners in Uganda, our social principles have been incorporated into the new National Biodiversity and Social Offset Strategy for Uganda, published by the Ministry of Water and Environment in June 2019.

These principles were published online in November 2018:

[Bull, J. W., Baker, J., Griffiths, V.F., Jones, J. P. G., and Milner-Gulland, E.J. 2018. Ensuring No net Loss for people as well as biodiversity: good practice principles.](#)

2. Uganda Poverty and Conservation Learning Group (U-PCLG) policy brief

During the course of my PhD, we discovered that the World Bank is in the process of refinancing the Bujagali Hydropower Project. The aim of this refinancing is to reduce the cost of electricity and make it more accessible to the rural poor. This will also be an opportunity for the World Bank to address the many environmental concerns of the project, notably, the implementation of the Kalagala Offset and the impact that the new Isimba dam may have on the offset. This will mean that the Kalagala Offset Sustainable Management Plan will be reviewed and updated. The refinancing of the Bujagali Hydropower Project is highly contentious, but we identified the refinancing is an important opportunity for our project to influence the new Kalagala Offset activities and updated sustainable management plan. We prepared a policy brief for the Ugandan government to use in their discussions with the World Bank about the design of the refinanced offset. The policy brief is based on Nature Uganda's biological findings and the social findings from my PhD and sets out 8 recommendations for the government to follow in order to improve the Kalagala Offset Sustainable Management Plan. The policy brief was published in March 2019 by the U-PCLG, a group established in 2011 to bring together Ugandan conservation and development practitioners to share their experiences and to work together to better inform policy and practice in the country. The brief concludes by strongly encouraging the government to incorporate these recommendations into an updated version of the Kalagala Offset Sustainable Management Plan. This will ensure that the new Plan not only addresses biodiversity NNL, but also the social impacts that could arise from biodiversity NNL activities. This will go a long way to help Uganda develop NNL policies and biodiversity offsets that are fair, socially acceptable and sustainable.

The U-PCLG brief is available online [here](#).

6. Conclusion

I would like to take this opportunity to thank Paul and Mary Slawson (and the Royal Geographical Society Slawson Award) for their generous grant that helped fund my field work and data collection in Uganda.

All protocols and procedures used for the social data collection were approved by both Oxford University's ethics committee and the Uganda National Council for Science and Technology (UNCST). Ethical clearance was received from the Research and Ethics Committee at Oxford University (Ref No: R43209/RE001) as well as from the National HIV/AIDS Research Committee at the Uganda National Council for Science and Technology (ARC 179). A research permit was received from the Uganda National Council for Science and Technology (NS 558).

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