



Universiteit  
Leiden  
The Netherlands

**Bridging the gap between bird conservation and sustainable development : perceptions and participation of rural people in Burkina Faso's Sahel region**

Bergh, M. van den

**Citation**

Bergh, M. van den. (2016, November 23). *Bridging the gap between bird conservation and sustainable development : perceptions and participation of rural people in Burkina Faso's Sahel region*. Retrieved from <https://hdl.handle.net/1887/44711>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/44711>

**Note:** To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/44711> holds various files of this Leiden University dissertation

**Author:** Bergh, Michiel van den

**Title:** Bridging the gap between bird conservation and sustainable development : perceptions and participation of rural people in Burkina Faso's Sahel region

**Issue Date:** 2016-11-23

## Conclusions

A changing environment: Trends and perceptions

### *Vegetation trends and causes: Perceptions, scientific data, and written sources compared*

Although the literature describes a re-greening of the Sahel since the mid-1980s and '90s, regional differences exist due to local differences in weather patterns and anthropogenic effects (Adams *et al.* 2014; Atkinson *et al.* 2014). Indeed, the Normalized Difference Vegetation Index data for the research areas clearly showed major differences between years and location, which was also regularly suggested by local inhabitants in both areas. Furthermore, vegetation cover trends were not always related to rainfall trends that were derived from SPOT-VEGETATION and CHIRP time series, respectively.

In Sourou and (especially) Higa many local inhabitants claimed a declining number of (large) trees, and some claimed a desertification threat, both due to several human-induced factors. Overgrazing was also mentioned as a serious threat, although primarily in Higa and/or by local authorities. In Higa, it was also sometimes suggested that burning of vegetation had led to the disappearance of vegetation and had caused subsequent erosion (land and soil erosion is the most common type of degradation in Burkina Faso's Sahel region, according to SP/CONEDD 2010).

Altogether, vegetation degradation seemed particularly evident in Higa. In that respect, it makes sense that remote sensing data revealed a distinct decrease in vegetation cover in Higa, particularly in the officially designated 'livestock area'.<sup>1</sup> Overgrazing (and wood cutting) might be a plausible explanation, as suggested by the local inhabitants. Several inhabitants supported the assumption that at the Higa 'lake area' large numbers of livestock from surrounding areas impact the vegetation cover when they pass through on their way to the lake. Further-

---

<sup>1</sup> The NDVI data revealed that in recent years a slight increase in vegetation cover had occurred at the 'lake area'.

more, pastoral activity is explicitly mentioned as an environmental issue in Higa by NATURAMA (2015), but not in Sourou.

The fact that NDVI data revealed a vegetation greening in Sourou, after an initial decreasing vegetation cover, does not necessarily contradict the local view of decreasing vegetation cover (which was also relatively less pronounced than in Higa).<sup>2</sup> The greening is probably the result of an increased surface of irrigated agricultural land (see also Helldén & Tottrup 2008). Rather, a transformation is probably observed: a decrease in natural vegetation and tree density, as suggested by the local inhabitants, and an increase in crop density, and thus environmental degradation. Indeed, conservation organizations consider increasing irrigated agricultural land an environmental problem, particularly in Sourou (NATURAMA 2015; Ramsar 2015, 2013).

In line with the conclusion drawn by Rasmussen et al. (2001) from observations in a (even) more northerly region in Burkina Faso, the current analysis shows that a broad generalization on land degradation processes is risky as significant variations exist locally. Similarly, this analysis does not point to a simple answer with respect to the discussion about whether natural or human factors should be considered the most important causes of observed vegetation change (Ibid.). Rather, it shows, as argued by, among others, Helldén & Tottrup (2008), that explanations for vegetation trends should be sought through a broad spectrum of factors.

#### *Environmental threats: Perceptions and written sources compared*

Environmental threats in the Sahel are primarily related to livestock (overgrazing and conversion of natural habitats into pastures), agriculture (intensification, irrigation and expanding of fields), and unsustainable wood harvesting (loss of trees and woodland) (Adams et al. 2014; Brito et al. 2014; Zwarts et al. 2009). Notably, all three issues are also locally indicated for the research areas, but issues related to livestock are less evident, at least compared to other perceived threats. This might be related to the fact that the impact of livestock and grazing pressure is manifold and often indirect (Zwarts et al. 2009; Hiernaux & Gérard 1999), and therefore less clearly allocated to livestock.

According to conservation organizations, the (unsustainable) cutting of branches and trees and expanding agricultural land are major environmental threats for both Sourou and Higa (however, most information is restricted to the

---

<sup>2</sup> In their study area in southern Mali, Tappan & McGahuey (2007) note that the general local perception is that local forest resources have degraded since decades, including a decline in trees. Nonetheless, a comparison of (historic) aerial photos does not reveal a loss of woody cover. However, they do note that the forested areas have probably become less biologically diverse.

wetland areas) (NATURAMA 2015; Ramsar 2015, 2013).<sup>3</sup> Interestingly, the tree issue was also a major environmental problem according to the local inhabitants. In contrast, expanding agricultural land was almost never mentioned by the local inhabitants; only a few inhabitants mentioned that fields close to rivers and lakes cause soil erosion. Other environmental threats and problems were raised by both conservation organizations and inhabitants, although the inhabitants mentioned a greater diversity of problems. One national conservation organization (NATURAMA 2015) indicated one issue that was not mentioned by the interviewees (namely harvesting of tubers of *Nymphaea lotus*). Despite a supposed increasing population in Sourou and Higa, population growth was never mentioned as an environmental threat.<sup>4</sup> This is consistent with those academics who question the inevitability of the link between rural population growth and environmental degradation (Adams 2002; Mortimore & Adams 2001; Raynaut 2001).

*Implications of environmental degradation: Perceptions and written sources compared*

Knowledge of Burkina Faso's and the research areas' avifauna is limited and much information still needs to be collected or verified (BirdLife 2015c; Lungren *et al.* 2001). We do know, however, that the population of many African-Palearctic (A-P) migrant species that winter in these areas are declining (Zwarts *et al.* 2009). Sahelian factors for decline are related to (populations of) species and their exact winter grounds, habitat requirements and the land-cover changes in these particular regions and habitats (Vickery *et al.* 2014; Atkinson *et al.* 2014).

In the research areas, many inhabitants thought that bird populations are declining, and various (human-induced) causes have been suggested. Some of these causes overlap with the ones found in the literature on A-P migrant birds in the Sahel, such as deforestation and the exploitation of birds. Evidence of a negative impact on birds in the Sahel is greatest for two land-use changes, namely the loss of wetlands and fewer trees in woodland habitats (although this is not the case for all species) (Mihoub *et al.* 2010; Zwarts *et al.* 2009; Thiollay 2006a). Despite this, local inhabitants only mention the lack of trees. This is not surprising because a loss of wetlands has probably not taken place in the research areas. The opposite occurred in Sourou, however, where there is an increased surface of (permanently) flooded land due to the damming of the Sourou river. It has been suggested that the most critical Sahelian land-use change for birds involves the extent of trees and scrub in rural landscapes (CCI 2010b). Interestingly, felling

---

<sup>3</sup> Knowledge of the local conservation conditions, as well as local conservation efforts, have increased considerably in recent years, following the implications of the Living on the Edge project.

<sup>4</sup> Although, a few interviewees suggested that population growth has led to conflicts as a result of increasing land scarcity.

and the lack of trees were the most frequently mentioned threats to birds in Sourou and (especially) Higa.

The severe Sahelian droughts and consequent environmental degradation in the 1970s and 1980s have shown us the kind of devastating impacts environmental degradation can have on local livelihoods (Dietz et al. 2004; Mortimore & Adams 2001). This study reveals that several contemporary environmental problems are still critical issues for people's livelihood, as environmental problems are among many people's main perceived problems in their lives. These were problems related to trees, soil, water and plagues of insects. Moreover, all interviewees indicated that environmental problems exist.

#### *Concluding remarks and implications for conservation*

Although a general greening of the Sahel is noted following increased rains and improved land use in recent decades, the exact causes of the greening are diverse and not always well-understood. Furthermore, environmental degradation is also (locally) detected, and human-induced environmental degradation is (still) threatening the survival of both birds and people, while droughts remain an ever-present threat (Ouédraogo *et al.* 2014; Brandt *et al.* 2014; Cresswell *et al.* 2007). Indeed, although some greening is observed, vegetation degradation is also detected in both research areas, and anthropogenic activities are an important factor. This shows that a detected greening (including by means of NDVI data) does not necessarily mean that natural vegetation, or vegetation that birds require, is restored (see also Atkinson *et al.* 2014). It therefore stresses the importance of determining the exact vegetation and land cover changes (through multiple methods).

Similar to Lindskog & Tengberg's (1994) findings in a slightly more northerly part of the Sahel region in Burkina Faso, local knowledge of land cover changes is in line with the scientific data. Furthermore, similar to their results and those from Audet-Bélanger's (2010) study in Ghana, the loss of forest and trees, especially big trees, was seen as an important environmental change. However, in this study, local inhabitants attributed the cause of land degradation to mostly human activities. This is in contrast to the results from Lindskog & Tengberg's (1994) older study in the northern parts of Burkina Faso's Sahel region. There, local inhabitants (i.e. Muslims from the Fulani ethnic groups, of which there are many in Higa) attributed the cause of land degradation to God, Allah. A change in who they ascribe the causes to possibly marks a change in people's (traditional) beliefs. In other words, the Fulani Muslims no longer ascribe such causes to God, Allah, and the Mossi no longer believe it is the work of the Supreme Being, Wende (see also Rupley *et al.* 2013; Asante & Mazama 2009a, 2009b; Lindskog & Tengberg 1994). It is possible that traditional beliefs are playing a diminishing

role in people's daily life, although not all authors would agree. Rupley *et al.* (2013) and Hadnes & Schumacher (2012) indicate that traditional beliefs still play an important role. The Sourou and Higa inhabitants' recognition of their own role is a major contributing factor for development organizations seeking local motivation and participation to combat environmental issues (see also Lindskog & Tengberg 1994).

Similar to the literature on environmental change in the Sahel (Brito *et al.* 2013; Zwarts *et al.* 2009; Mortimore & Adams 2001), conservation organizations indicate that agricultural expansion and increased livestock grazing (Higa only) are among the principal environmental problems in the research areas (NATURAMA 2015; Ramsar 2015, 2013). These problems were, however, seldom mentioned by the local inhabitants. The issue of expanding agriculture was mentioned even less often in Higa with a more pastoral orientation, while the overgrazing issue was never mentioned in Sourou with a more agricultural orientation. Thus, local context, including land-use practices, appears to influence the perceived environmental problems. This does not explain the relative lack of mentioned agriculture and livestock grazing issues, however. Perhaps people's high dependence on these livelihood activities prevents them from seeing these activities as potential environmental problems. Besides, the environment is sometimes seen as one that supports all aspects of life, including agriculture (see also next section). Most notably, the unsustainable use of wood has led to a serious loss of trees according to local inhabitants. This issue is also mentioned as an environmental problem in these areas by conservation organizations, and as a major problem for the whole Sahel in more general Sahelian literature (NATURAMA 2015; Ramsar 2015; Adams *et al.* 2014).

Conservation organizations and local inhabitants show slight differences in how environmental problems are perceived and/or communicated. Conservation organizations often mention a process (i.e. the drivers of environmental change), while inhabitants often mention the consequences (i.e. the environmental change). For example, conservation organizations generally talk about environmental issues, such as tree cutting, overfishing and soil degradation, whereas local inhabitants usually talk about lack of trees, lack of fish, and degraded soil. To catch people's attention, the consequences of problems should therefore also be communicated, as inhabitants are more aware and worried about the actual consequences than the processes behind them.

Recent studies have started to uncover the (severity of the) impacts of environmental degradation in the Sahel on A-P migrant birds (Adams *et al.* 2014; Atkinson *et al.* 2014; Vickery *et al.* 2014; Zwarts *et al.* 2009). Local inhabitants are reasonably aware of the threats birds face, but some threats are unknown to the inhabitants. These threats are either locally non-existent (i.e. the loss of wet-

lands) or they are largely invisible (i.e. chemical pesticide). This illustrates that those less visible, often indirect, threats should be explained to local populations by conservation organizations if these threats must be addressed. The fact that inhabitants recognized (other) threats to birds helps to raise awareness about these issues to their attention and it makes them realize why conservationists are actively involved in combatting these threats.

Importantly, many of these threats to birds were perceived as major environmental problems by local inhabitants, including problems that were seen to have a significant impact on people's lives. This shows that addressing these issues is also a priority for local livelihood improvement. The tree problem is among these 'livelihood issues', and is also a major threat to A-P migrant birds (CCI 2010b). However, the livelihood problem of insects (plagues) does not pose a threat to birds; indeed, the opposite is true, as many (A-P migrant) bird species feed intensively on locusts and grasshoppers (Zwarts *et al.* 2009). Soil and water issues were perhaps less directly related to birds. However, they are related, to a greater or lesser extent, to trees as they retain soil and water and reduce floods, as was sometimes suggested locally.

In conclusion, this comparison shows that retaining and/or increasing the number of trees would be an effective way of achieving community-based (migrant) bird conservation that contributes to local sustainable development. Although the heterogeneity of the Sahel is marked (Raynaut 2001), and similar comparisons should be made at specific locations, it highlights that trees warrant close attention and shows that these comparisons can help address those issues that are (locally) relevant to both birds and people.

Local values of birds, the environment, and conservation

#### *The perceived values of birds and the environment*

The environment was seen by local inhabitants as highly important to their livelihoods, and also for their coping strategies and socio-cultural values. Inhabitants commonly saw the bush and the immediate surroundings of the village as their natural environment and one that supports all aspects of life, including agriculture. Ingold (2011) found the same perceptions among the Dogon in neighbouring Mali. The lives and livelihoods of the local inhabitants were strongly linked with the natural environment, mainly through the environment's supporting and provisioning services (including the environment's capacity to support agriculture and the provision of wood, water and food, respectively). Both categories are thus linked with providing a livelihood.

Birds are often considered an integral part of the environment and play numerous roles in people's lives, frequently directly related to their livelihood ac-



tivities. Only a few men expressed themselves negatively towards all birds. Generally, there are two perceptions regarding birds: either a positive perception of all birds or a positive perception of large birds but a negative perception of small (seed-eating) birds that feed on crops. The positive perception generally prevails. The reasons for people's positive attitude towards birds were diverse, and were both socio-cultural and socio-economic in nature. In fact, an aesthetic value was regularly attributed to birds, and in both research areas a good number of inhabitants indicated that birds are valued as food source. In addition, birds were often valued as an indicator for (coming) events, environmental conditions or (potential) dangers, and for fulfilling their ecological role, such as vultures 'cleaning' carcasses. Some inhabitants, especially members from a local conservation group, were aware of migratory birds wintering in their area, sometimes resulting in a sense of pride.<sup>5</sup>

Inhabitants' perceptions of birds and the environment were influenced by the local context and individual characteristics. Regarding local context, for example, people in the less developed Higa area appeared to be more connected with the environment, and birds played a more 'basic' role in their lives (such as locating surface water or dead livestock by observing birds). On the other hand, the use of chemical fertilizers was only mentioned as an environmental problem in the more (agriculturally) developed Sourou area. Regarding individual characteristics, for example, people who were more dependent on subsistence farming, i.e. the population with predominantly agricultural livelihoods, were markedly more negative towards small birds (which should be linked with the threats that birds pose to their crops). On the other hand, fishermen were less concerned with the decline in the number of trees, but were, for obvious reasons, more concerned with (unsustainable) fishing issues.<sup>6</sup>

#### *Attitudes towards (bird) conservation*

Almost all of those interviewed believed that there were solutions to environmental problems. These solutions were most frequently related to retaining or increasing the number of trees. Although most of the literature on local environmental and conservation perceptions is limited to protected areas (see e.g. Tessema *et al.* 2010; Infield & Namara 2001; Gillingham & Lee 1999), most of the world's biodiversity is not in protected areas but on lands and waters used by people for their livelihoods (Berkes 2013). Creating protected areas is unlikely to be effective for migrant (land) bird conservation as many species are found in

---

<sup>5</sup> However, distinction between African non-migrant species, and African and/or A-P migrant species was usually not made, and often unknown, and local perceptions therefore usually concerned birds in general.

<sup>6</sup> Some livelihood characteristics were more common in one of the two research areas, often because of the local context, and in these cases individual characteristics and local context overlap.

relatively low densities across the wider agricultural landscape on land that is owned and managed by rural people who are living in extreme poverty (Adams *et al.* 2014; Bernd de Bruijn, senior international policy officer at *Vogelbescherming Nederland*, *pers. comm.* November 2015).<sup>7</sup> The creation of protected areas was suggested by only one interviewee.

I have demonstrated that both birds and the environment are valued in many ways and are strongly linked with local livelihoods. At the same time, the study shows that serious environmental problems exist, and that both local livelihoods and birds are negatively impacted. This has created, among other things, conservation incentives among the local population. Muslims and inhabitants who collaborate with conservation organizations (namely, Local Conservation Group (LCG) members) were the most positive towards (bird) conservation. Surprisingly, children were the least positive, which raises a question about the role of education. People were generally positive about bird conservation, except for small birds, which are considered pests as they cause damage to agriculture by feeding on local crops. Not surprisingly, when livelihoods were under threat from wildlife, (general) conservation incentives diminished.

Inhabitants' conservation incentives were mainly focused on people's own or their communities' interests. Similar to their general conservation incentives, bird conservation incentives were focused mainly on respondents' own interests, followed by aesthetic features. Conservation incentives were influenced by the local context (environmental conditions, local events and the level of human development) and individual characteristics (e.g. gender and education). The more distinct individual variables in this regard were livelihood activities, religion, LCG (board) membership, local authority and age (i.e. adults versus children).

### *Concluding remarks and implications for conservation*

The environment is seen as being highly important to people's livelihoods, and also for their coping strategies and their socio-cultural values. Trees are highly valued by local inhabitants and authorities and also have a (perceived) crucial link with local livelihoods and affect, for example, flooding levels and soil degradation. The focus on trees was even more pronounced in people's conservation perspectives.<sup>8</sup> Birds, including those that migrate, are often considered an integral part of the environment and play numerous roles in people's lives, sometimes directly related to their livelihoods.<sup>9</sup> Birds are seen by some inhabitants as an

---

<sup>7</sup> However, parks and protected areas might be appropriate conservation strategies at biodiversity hotspots, such as Important Bird Areas (see Box 2.3).

<sup>8</sup> It should be noted that the focus on trees by both local inhabitants and (local) governments as well as conservation organizations can undoubtedly reinforce each other's emphasis on trees.

<sup>9</sup> Including as coping strategy, namely hunting wildlife, including birds, in periods of extreme drought.

indicator of environmental health and are therefore useful in addressing conservation issues (BirdLife 2000). These local values demonstrate the perceived importance of a healthy environment for birds and people alike, showing that (migrant) bird conservation can contribute to local development and livelihood improvement.

In line with the argumentation provided in this study (based on literature; see also Chapter 2), there was, except for one, no suggestion to create protected areas as a solution to environmental problems. Hence, promoting sustainable land-use practices that contribute to habitat restoration and conservation as well as better livelihoods for local people appears to be more appropriate (Van den Bergh 2014). Trees form a noticeable and strong link between bird conservation and livelihood improvement, especially those tree species that are of particular value to both birds and people (such as *Faidherbia albida*). Importantly, this link is clearly recognized by the local inhabitants, making it an excellent target for community-based conservation.

Because environmental, bird, and conservation values were often linked with people's livelihoods, understanding individual (including livelihood) characteristics is crucial. This need is emphasized by the influence of individual characteristics on conservation incentives. Conservation incentives were also influenced by local context. This reiterates that conservation action in the Sahel should be heterogeneous, and thus adapted to the local context. Conservation efforts in consideration of local context and individual characteristics increase the (perceived) relevance for the targeted population, thereby promoting participation and contributing to efficiency and effectiveness as people respond to those issues that locally matter.

Local context should be considered, including the area's specific environmental conditions, the occurrence of local events, and the level of human development. For example, after the occurrence of recent floods and (associated) erosion issues, the trees' capacity to prevent or limit floods and erosion can be explained to promote the protection and planting of tree seedlings. Further, conservation actions that are relevant for the inhabitants' local environment should be communicated, as should those relevant to the wider environment, albeit to a lesser extent. Similarly, issues should be addressed that are relevant in developed or less-developed areas, according to the local context. Understanding the level of reliance on, and the level of interrelation with the natural environment, is important in this regard. Similarly, stakeholder groups can be used to address individual characteristics, including livelihood, local authorities, and children groups, but also churches and mosques. Children were generally less connected with the environment and birds than adults and showed less interest in conservation issues. Moreover, while children regularly hunted birds with slingshots, none of

them were familiar with the system of hunting permits. Together with teachers and curriculum developers, a relevant and meaningful approach needs to be developed to educate youngsters about hunting legislation and the environment, including about birds and their contribution to the quality of people's lives in the region. This kind of education seems desirable as the children in this study were the least positive towards bird conservation. Moreover, a higher level of education did not lead to a more positive perception of (small) birds (rather, the opposite was noticed). Indeed, raising awareness and education about birds and the environment in a more general sense was also frequently suggested by both the local authorities and the local population, including children.

On the other hand, hunting can also be a tool for promoting conservation, as local peoples' use of wild birds as a food source can act as a conservation incentive (as noted in this study, but also in northern Ghana; see Owusu 2008). The large concentrations of wildfowl in Burkina Faso and the research areas, and in Sourou in particular, (Porter *et al.* 2002; Fishpool & Evans 2001) probably provide excellent hunting opportunities. In fact, a tourist organization is providing hunting trips in Sourou (Somda *et al.* 2010). This could potentially provide an additional hunting-induced conservation incentive, i.e. in addition to providing a food source hunting tourism can provide an income. However, hunting can also pose a threat to A-P migrant birds (Zwarts *et al.* 2009), which are already targeted in Sourou (Somda *et al.* 2010). Indeed, the consequences of recreational hunting are complex and its conservation and livelihood benefits are disputed (Dickson *et al.* 2009). Education and raising awareness, including about the impact of hunting (on particular species), but also hunting law enforcement should be promoted by governments and conservation organizations. In fact, the most frequently mentioned measure to protect birds was a ban on hunting, but this suggestion did not necessarily refer to law enforcement. Education, especially on the subject of hunting, was also mentioned, as was the fact that people should just stop hunting.

The current study has highlighted how poor, rural people are mindful of the crucial relationship between their livelihoods and the natural environment, in which birds play a multitude of roles and local inhabitants demonstrate a positive attitude towards (bird) conservation, provided that their own livelihoods are not threatened. Conservation incentives were focused mainly on respondents' own interests. Bird conservation should therefore focus on positive links between bird(s) (conservation) and individual livelihood aspects. Increasing the number of trees is the most important aspect in this regard. This should be stimulated at local (farm) level, or at most at community level, thus linking it to people's own livelihood. Furthermore, some (of the earlier mentioned) less well known (potential) conservation incentives should be explained and promoted in such a way that people can recognize the actual benefits of conservation. Thus, local inhabitants

have to understand that certain conservation measures are in their own interests, and conflicts with wildlife should be addressed. This does not mean, however, that conservation action should be entirely voluntary, and that law enforcement can be neglected. On the contrary, the two concepts are not mutually exclusive and both should be pursued (Infield & Namara 2001). The many aesthetic values, particularly for birds, serve as conservation incentives, which can be facilitated by communicating and promoting these values. In particular, the sense of pride about receiving migrant birds, which was also a catalyst for being a supporter of the protection of these birds, could stimulate migrant bird conservation.

In conclusion, when the above aspects are taken into account, bird conservation can positively contribute to local inhabitants' livelihoods and socio-cultural values, specifically in a way that they themselves value. Knowing and understanding local perceptions, including the perceived bird and environmental values, and related conservation incentives should be considered important. By focusing on conservation action on environmental issues that are also valued by the local inhabitants, the needs and wishes of local populations can be addressed (Owusu & Ekpe 2011; Lindskog & Tengberg 1994). In this way, local inhabitants have genuine motives and intentions for participation in related conservation and sustainable land-use activities. This promotes continued and increased participation (see also Roe *et al.* 2006; Ribot 2003, 1999), not least because most incentives were focused mainly on respondents' own interests. People's realization that something can be done about the environmental problems raises hope for the participation of local inhabitants in conservation efforts. As suggested by Infield & Namara (2001), involving local inhabitants can produce significant improvements in conservation attitudes. Indeed, although LCG members held similar views on birds to non-members, they were generally more positive about bird conservation.

#### Local population participation

##### *Conservation through local participation*

Local participation is a key element in the conservation strategy for A-P migrant birds; not least because livelihood improvement and conservation goals can and should be integrated (Roe *et al.* 2010; Adams *et al.* 2004). Indeed, as most land is managed by local inhabitants for their subsistence livelihoods and A-P migrant land birds occur in the wider landscape, the participation of local inhabitants is needed for a more sustainable Sahelian landscape. Moreover, local participation should increase efficiency, contribute to equity and can be used to include objectives and priorities of communities, among other things, and is therefore frequently promoted by all actor groups in Burkina Faso (Adams *et al.* 2014; Roe *et al.* 2006; Ribot 1999). As argued in the previous section, local participation can

improve local conservation attitudes, while the variables of local context and individual characteristic can be incorporated in conservation strategies through the participation of the local population in project design.

Importantly, the above sections also show that there are favourable conditions for local participation. These conditions include people's recognition of their own environmental impact (see also Lindskog & Tengberg 1994), their (current) realization that something can be done about existing environmental problems, as well as people's recognition of the link between bird conservation and livelihood improvement aspects, such as the protection of trees. Furthermore, and significantly, people generally show a positive attitude towards conservation and local conservation incentives exist. Also, environmentally-related human conflicts appear to be (at most) incidental, while land-related conflicts were also perceived as uncommon and many inhabitants thought they were non-existent. Land-related conflicts arise mostly between pastoralists<sup>10</sup> and farmers (see also UNEP 2007; Kuba *et al.* 2003), and generally about livestock eating crops from farmers' fields. In contrast to what UNEP (2007) and Kuba *et al.* (2003) note, conflicts with immigrants and nomadic people were rarely mentioned, which also applied to conflicts between different ethnic groups (in contrast to what Kuba *et al.* 2003 note). Similar, in contrast to observations by Coulibaly-Lingani *et al.* (2011) in Burkina Faso, conflicts over decision-making power were not revealed. In sum, (land) conflicts were seldom related to autochthony claims, even though migration is extensive in Burkina Faso and the research areas (see also Geschiere 2009).<sup>11</sup> The relatively limited degree of conflicts and the notable lack of conflicts between the many different religious and ethnic groups present, appears to favour local collaborative participation.

However, local participation generally remains limited in the studied areas, even though local collaboration partnerships are common (especially with international government organizations). Different causes have been revealed, such as too close relationships between the local population and (conservation) donor organizations and limited tangible benefits from their joint activities (despite the fact that activities often contribute to sustainable development).<sup>12</sup> Furthermore, development actors did not cede enough power and control to the local population to promote participation, even though these were often elements of the or-

---

<sup>10</sup> In this case, generally referring to the owner of livestock, who may or may not also be an agriculturist.

<sup>11</sup> The term autochthony is often used as a political tool to separate 'locals' from 'people from elsewhere'. In West Africa the term was introduced by French colonials around 1900 who struggled with the question of how to administrate land. In Ivory Coast, for example, only autochthons had full citizen rights, notably the right to own land. Autochthony remains a key matter there in issues such as belonging, including land ownership, and associated conflicts (Geschiere 2009).

<sup>12</sup> Engberg-Pedersen (1995) also noted that local people were not participating in labour-intensive resource-conservation activities unless they were expected to be profitable in the near future.

ganization's stated objectives.<sup>13</sup> Thus, a rather top-down approach was used and local empowerment was not achieved. Indeed, inhabitants frequently rated local participation as (too) limited and wished to have more input. Their limited negotiation potential could avert any sustainable relations (Raynaut 2001). Nonetheless, the local study population generally rated the collaboration with development actors (DAs) as positive. Also, interactions at the interface showed that the collaboration between DAs and the local population did not take place in the form of struggles and conflict, as is often the case according to Engberg-Pedersen (2003), but rather of reasonable collaboration. However, the limited participation also limited their involvement and therefore threatened the (long-term) sustainability of the projects and activities.

Although genuine participation in project design was also observed, it was usually restricted to the board members of community organizations (COs), and decision-making was mostly done by the development actors. Furthermore, local people's position at the social interface was influenced by their individual characteristics (such as 'gender', 'job function', and 'seniority'), and, for example, a young uneducated woman would probably find it difficult to get her voice heard. In sum, the local population did not move to a full partner position, and sometimes their role was merely to implement the project activities. Women were even less involved in the activities, at least partly as a result of development actors' discriminatory attitude towards women. Similarly, the men of the local population also regularly had negative perceptions of women's capabilities; hence, women were often excluded from CO membership (and were therefore automatically excluded from the COs' collaboration with development actors).

#### *Local participation through community organizations*

Collaboration with the local population mostly took place through COs, which was especially valued by DAs because many people (i.e. CO members) could be reached through the collaboration with only a selection of people (i.e. CO board members). However, some members participated in only one or a few of the COs' activities, and many of the LCGs' conservation-related activities were executed by a few (board) members, with the exception of tree planting. Also, COs do not represent the whole population, and, in particular, the poorest inhabitants and women are least likely to be members of a CO. In addition, COs may be organizations that often have members of a rather homogeneous composition (e.g. when limited to male farmers); yet, through their community networks, COs can

---

<sup>13</sup> Because employees' emphasis on local collaboration differed sometimes from their organizations' policies, as propagated through their mission statement, arguably it shows that DAs' local collaboration is indeed shaped by actors' relationships and interests and cultures of specific organizational settings, rather than by their policy models, as suggested by Mosse (2005, 2004).

provide a platform for the wider community (see also Thomas 2011). On the other hand, limited external communication appeared to be limiting communities' awareness of COs,<sup>14</sup> restraining collaboration with and/or assistance to local inhabitants and limiting collaboration between conservation-minded COs and other COs. In fact, government officials were the major collaboration partners of COs.

The majority of the COs studied demonstrated a link with Burkina Faso's and/or NGOs' decentralization policies. Because heterogeneous and flexible conservation strategies are required in the Sahel (as argued in this study), decentralization seems a positive development. However, in line with observations from Kassibo (2006) in neighbouring Mali, most COs studied had few characteristics relating to democratic decentralization, as devolution (namely the transfer powers to democratically elected COs) was limited (see also Ribot *et al.* 2010). This could be severely limiting the communities' role in conservation and natural resource management, which depends greatly on the negotiation power of these organizations (Ribot 2003; Benjaminsen 2000). Like the LCGs, many COs revealed elements of a participatory approach (Ribot *et al.* 2010), which included the consultation, mobilization, or involvement of local people. The creation and retaining of COs, including their many tree planting activities, arguably indicates that local populations did much to comply with project suggestions and requirements, arguably in order to obtain access to resources controlled by projects and NGOs (see e.g. Engberg-Pedersen 2003; Marcussen 1999). This has resulted in perhaps too many COs, creating too much overlap and conflicts. Furthermore, COs created with help from conservation organizations implemented conservation activities following the instructions of these donor (conservation) organizations.

Most conservation-related activities by COs provide inadequate tangible (financial) short-term benefits, which leaves the organizations (financially) dependent on their donor organization(s). This, in turn, reduces the empowerment of these organizations. The limited and basic level of management and governance capabilities in most of these organizations further reduce empowerment and financial improvement, and discouraged people from becoming a member. The factors behind inadequate management include a lack of discipline, incidental (or suspected) fraudulent activities, board members not having sufficient management training, and their sometimes extremely limited knowledge of their organization's objectives. Furthermore, little or no education and high illiteracy rates among (board) members were other important factors, which are undoubtedly related to general poverty and a lack of access to education in rural areas of the Sahel. These are likely also to be due, in part, to poor communication and may be

---

<sup>14</sup> COs were better known locally in smaller communities with a lower population, such as in Higa.



contributing to limited collaborative practices with other organizations and community members.

Although the vast majority of members are unpaid volunteers, they do regularly receive money or food as an allowance for participating in an activity, because profits are seldom made. A lack of financial resources has been perceived as a major reason why some COs had not yet been able to achieve their goals. Other less or not conservation focused COs were more focused on profit-making. These profit-making activities contribute to independency, participation and empowerment, but, at the same time, this makes them more vulnerable to bad agricultural and/or trade conditions, which can lead to a halt in activities or even to the end of an organization.

#### *Concluding remarks and implication for conservation*

As participation and the delegation of authority (including decision-making) was generally limited in the study areas, empowerment also appeared limited and the collaboration between DAs and the local populations often showed characteristics of pseudo-participation (i.e. participation that is merely composed of assistance and consultation). However, local representation and democracy appear to be promoted at the social interface, as DAs work directly with the community or through locally elected leaders, and not through influential non-elected people.<sup>15</sup> Further participation is needed for a more widespread and long-term sustainable land use.<sup>16</sup>

The study reveals several ways to promote participation, including through profound decentralization policies (DAs should consider working with a local representative); long-term project vision (including feasibility to continue activities without support); local capacity building (including improved local management, such as community organization with educated and trained board members); reward-driven activities (including tangible benefits); managing expectations (being cautious not to promise too much to the local population); people's genuine motives (namely, to pursue project objectives and not just to comply with DAs' objectives); the scope of activities (activities that are locally perceived as important); linking to individual livelihoods (e.g. planting trees at local farm level); and catching people's attention (by communicating the consequences of problems). Participation should include elements of local empowerment, local decision-making and local authority through local involvement in project proposal, design and management, and the provision of financial benefits and resources. Strict laws and implementation systems are needed to ensure local insti-

---

<sup>15</sup> This could promote downward accountability and hence increase democratic decentralization (see also Kassibo 2006).

<sup>16</sup> As was also demonstrated by the 'Oursi' conservation project, and its best practices served as an example for the *Living on the Edge* project.

tutions and individuals gain authority (Kassibo 2006, 2002). Moreover, all community groups should be included, including women and the poorest community members.

Through their community networks, COs can provide a platform for the wider community (see also Thomas 2011). However, DAs should consider also including other collaboration structures (e.g. decentralizing their organizations and working directly with the population) in order to include those who are not a member of any CO and/or to encourage COs to diversify their membership. Similarly, when engaging in partnerships, COs should be chosen carefully according to their representation of the community (i.e. composition of membership). Also, as Engberg-Pedersen (1995) noticed earlier in Burkina Faso, existing local institutions are perhaps overlooked. DAs should consider working with existing COs instead of supporting the creation of a new one, and at least be mindful of newly created COs that would have (too) much overlap in activities and objectives with other already existing COs. Furthermore, new COs should perhaps only be promoted when local inhabitants have genuine motives and intentions, and not when inhabitants do it merely to comply with DAs' requirements, because 'false' motives could threaten the sustainability of the CO and/or activities.

Indeed, as Mahanty & Russel (2002) suggest, conservationists need to pay greater attention to how organizations form and function, to their links to the wider community, and to the aims and positions of organizations and members. Especially so considering that the COs' own organizational contexts are complex due to the variety of cultures, religions, ethnicities and livelihoods of their members (see also Hilhorst 2008).<sup>17</sup> Capacity building proved to be an important factor for the participation of local organizations, as was also demonstrated in a successful conservation project ('Oursi') in northern Burkina Faso, and could improve the (currently often poor) functioning of COs. This should certainly be considered in particularly poor and underdeveloped areas. As the communities' role in NRM depends greatly on the negotiation power of COs (Ribot 2003; Benjaminsen 2000), the organizations should reach a high degree of independence – including by generating income – in order to gain negotiation power.

In conclusion, if the above mentioned aspects are promoted and included, decentralization and participation policies can contribute to (long-term) sustainable community-based conservation. Indeed, local participation should be considered a key element in any integrated (A-P migrant bird) conservation and sustainable

---

<sup>17</sup> The diversity of ethnicity among the COs' members meant it was difficult or impossible to determine the possible influence of the (historic) social organization of different ethnic groups on the functioning of COs. For example, no groups with specific ethnic characteristics existed and comparison between such groups could thus not be made.

development effort, including – although not exclusively – through independent and highly motivated COs.

Bridging the gap between bird conservation and sustainable development

*The (perceived) link between birds, conservation, and sustainable development*

Birds, including those that migrate, are typically valued by the studied local population in many (socio-cultural and socio-economic) ways, and play numerous positive roles in people's lives, sometimes directly related to their livelihoods. Bird species present an excellent indicator of environmental health and conservation issues (BirdLife 2000), as is often also indicated by the inhabitants themselves, and therefore present a focus when it comes to conserving ecosystems, critical habitats and key issues. Many of these conservation issues are of global value and/or concern (Fowlie 2010) and many are also strongly linked with local livelihoods, including those in the Sahel (Mortimore 2009) and the research areas. In fact, this study shows that addressing many of the threats faced by (A-P migrant) birds will also positively impact the livelihood of the local population. Birds can therefore provide an ecological base in Sahelian conservation interventions that are of local and global concern to people. Indeed, this study highlights how poor, rural people, are mindful of the crucial relationship between their livelihoods and the natural environment, and that the inhabitants demonstrate a positive attitude towards (bird) conservation, provided that their own livelihoods are not threatened. It is of prime importance that any conservation effort should address such issues. I conclude therefore that A-P migrant bird conservation should, and can, work hand in hand with livelihood improvement and sustainable development objectives in the Sahel.

It has been observed that farmers in the Sahel have improved their land management in recent times, and many reforestation initiatives have emerged (Reij 2010; Botoni & Reij 2009; Jones *et al.* 1996), including in the research areas. This, together with increased rainfall and large-scale reforestation efforts, has led to the greening of large areas in Burkina Faso and neighbouring countries (Berahmouni *et al.* 2014; Botoni & Reij 2009; Dietz *et al.* 2004). This study shows that retaining and/or increasing the number of trees (in fields) is in fact the most evident way to achieve both (migrant bird) conservation and sustainable development objectives. Trees have a perceived crucial link with local livelihoods and affect, for example, flooding levels and soil degradation, and are especially valued for their wood. Trees play an essential role in the perceptions that the local inhabitants and authorities have of the environment and conservation, especially regarding birds. For many A-P migrant birds, a healthy amount of trees in rural

landscapes is vital (and for many species perhaps the most important element; Zwarts & Bijlsma 2015b). Trees thus form an important and locally recognized link between bird conservation and livelihood improvement, making it an excellent target for community-based conservation. Tree planting was also the only regular conservation-related activity of the COs studied, and was the only conservation-related activity executed by most of their members.

However, trees are certainly not the only perceived link between birds, conservation and local livelihoods. Both birds and people benefit in general from a more sustainable land use, in which natural resources, such as natural vegetation, is partially retained. Indeed, it is recognized that the environment's supporting and provisioning services are important. Furthermore, many socio-cultural, including aesthetic, and socio-economic values of birds, exist among the local inhabitants.

#### *Perceptions and participation of the local populations*

As argued in this study, the participation of local inhabitants is needed for a more sustainable Sahelian landscape. In fact, the study provides a strong argument for the need to increase local participation. It demonstrates several ways to do so, including through a much needed better understanding of local needs, attitudes and aspirations (see e.g. Owusu & Ekpe 2011; Lindskog & Tengberg 1994). By understanding the relationship between the inhabitants, the birds, the environment, and conservation, and addressing issues that are perceived as being important for their livelihood, the needs and wishes of the local populations can be mutually addressed by the conservation efforts. At the same time, local perceptions can reveal, potentially, unknown threats, problems and causes to DAs. Furthermore, by knowing which threats, problems and causes the local population recognizes and identifies for birds and/or people, DAs can adjust their communication and project strategies accordingly thereby increasing overall efficiency and effectiveness of the approach. For example, by explaining those important (locally occurring) issues that are apparently unknown to the local population, including those based on scientific data, and addressing, without detailed explanation, those that are already known to them.<sup>18</sup> Similarly, some (of the earlier mentioned) less well known conservation incentives should be explained and promoted in such a way that people can recognize the actual benefits from conservation. In this way we can avert 'the tragedy of the commons' doomsday scenario (Hardin 1968), in which individuals exploit shared resources independent-

---

<sup>18</sup> The study's analysis of the perceptions and attitudes also shows that many of the activities that people directly depend on and/or strongly benefit from (such as agriculture) remain – deliberately or not – unrecognized as potential environmental threats.

ly, according to their own self-interest, and act contrary to the common good by depleting natural resources through collective exploitation.

Thus, for any successful initiative, the local inhabitants have to understand that certain conservation measures are in their own interest, so that they have a genuine motive in participating in the conservation and sustainable land-use activities. Careful thought should be given to how environmental issues are communicated, for example, we should primarily communicate the conservation actions that are relevant for the inhabitants' local environment, and to a lesser extent those of the wider environment. We would therefore expect a continued and increased participation, given that most incentives are focused mainly on respondents' own interests.<sup>19</sup> In addition, it is important that the consequences of activities are explicitly communicated, as inhabitants are more aware and worried about the consequences of actions than the processes behind them.

The many profound differences between the two rural research areas (notably on the subjects of ecology, economy, institutions, and local perceptions), as well as the diverging ecological changes over time within both areas, have illustrated and highlighted that conservation strategies in the Sahel should be heterogeneous and flexible; geographically and over time. Indeed, the heterogeneity of the Sahel is recognized (Raynaut 2001). Knowing the local context, including the area's specific environmental conditions, the occurrence of local events and the level of human development, acting accordingly is therefore essential (see for similar arguments, Raynaut 2001). Because environmental, bird, and conservation values were often linked with people's livelihoods, understanding the characteristics of the local inhabitants is crucial, including livelihood activities, religion, LCG (board) membership, local authority, and age. In fact, inhabitants' perceptions, including their conservation incentives, were influenced by local context and individual characteristics. Nonetheless, this study also demonstrates that some environmental issues are less local context- and people-specific and that some conservation goals are beneficial for many different people (i.e., in both rural research areas), including increasing the number of trees. Indeed, the challenge is to respond to specific local conditions, while also considering wider issues (Raynaut 2001).

Thus, the two variables: local context and individual characteristics, should both be considered and used to direct conservation in a more efficient manner, targeting the issues that matter to the local environment as well as to the local inhabitants. Indeed, as Borrini-Feyerabend *et al.* (2007) indicate, there are two key challenges in managing natural resources, and particularly in integrated con-

---

<sup>19</sup> Thus, a comparison of environmental threats, problems, and causes between scientific data, written resources and local perceptions can help address those issues that are (locally) relevant to both birds and people.

ervation and sustainable development projects: responding appropriately to the ecological and to the social characteristics of the local environment. Incorporating these variables in intervention strategies can be done by designing them in collaboration with local populations. This goes beyond presenting different options of interventions to the local populations, as suggested by, for example, Batterbury (2001). It should include formal<sup>20</sup> local participation in the project design. In other words, there should be participation with strong elements of co-management (Borrini-Feyerabend *et al.* 2007). For example, stakeholder groups, including livelihood, local authority and children groups, but also churches and mosques, can be used to address issues in such a way that correspond(s) with individual characteristics. Also, stakeholder groups can be used to offer a voice to those who would otherwise not be heard, such as young uneducated women.

A popular strategy for DAs to involve the local population is through COs (including LCGs), because they allow for many people (i.e. CO members) to be reached through collaboration with a limited selection of people (i.e. CO board members). However, COs do not represent the whole population. Moreover, this study highlights several shortcomings in the functioning of COs, such as limited capacity and an often strong dependence on DAs. Unfortunately, many COs have not (yet) lived up to the governmental and non-governmental organizations' expectations or reached their participation and empowerment objectives (BirdLife 2011; Clearly 2003; Gray 2002). Also, with the exception of LCGs, COs have few conservation-related activities. Those activities undertaken by LCGs tend to be carried out by only a few members, with the exception of tree planting. Several recommendations are therefore provided in this study, such as including other local collaboration structures, in addition to also investing in capacity building, increasing the number of activities with tangible and financial benefits, and promoting a long-term vision.

### *The need for a long-term vision*

One of the key issues with most conservation activities, is that benefits are not felt in the short-term (see also Engberg-Pedersen 1995). Conservation action is therefore also a matter of long-term vision and investment. For instance, a tree seedling takes years before becoming a tree of significant size. In fact, seedlings are regularly planted by the communities and LCGs, but the long-term success rate of such planting has been limited and many have died due to a lack of water, livestock browsing and trampling. A lack of care for the planted trees was also noted, and suggested by several local inhabitants. Larwanou & Saadou (2011) show that taking care of (planted) trees can be an important tool for the conserva-

---

<sup>20</sup> A clear institution should be formulated by all actors involved to support a fair decision-making process and to prevent disagreement about the course of events (see also Ostrom 2015 and North 1990).

tion of trees. I therefore propose assigning reforestation resources to protect and care for planted trees, and that staff who look after these areas should be rewarded in accordance to proven results. In addition, tree planting and tree protection should be linked to people's own livelihood, and as such stimulated at the local (farm) level, or at most at the community level.<sup>21</sup> Regeneration efforts are possibly more successful than reforestation efforts, and are a low cost and effective way to increase the number of trees (and other vegetation) (Brandt *et al.* 2014; Larwanou & Saadou 2011; Reij 2010).

Similarly, institution and capacity building, which are essential elements for the participation of local organizations, also require considerable and long-term (labour) investments. Indeed, this study reveals that increasing the duration of projects was a common local aspiration, including the provision of resources for the continuation of the project when the conservation organization pulls out. Thus, for long-term sustainability, DAs should consider increasing the duration of the project and/or develop a follow-up project. Preferably, the project should provide the local inhabitants with enough capacity, skills and resources to continue activities when the project and/or DA's assistance has ceased. Profit-making is an important aspect for continued efforts as they often involve financial investments, but many conservation efforts include sustainable land-use practices that do not provide (direct) profits. For this reason, awareness and education about the long-term benefits, in particular financial, should be important elements in any conservation effort in order to convince people to make considerable long-term (financial) investments in activities without direct/immediate tangible benefits.

Indeed, an often recurring aspect in both environmental and bird conservation perceptions is the importance of raising awareness and education. The numerous socio-cultural values, including aesthetic values (particularly for birds), that existed among many local inhabitants could be used more widely to promote conservation incentives, in particular, elevating the sense of pride at receiving (A-P) migrant birds. Education and awareness-raising should address the importance of birds, the environment, and conservation, but should also cover hunting and environmental legislation, as many people were rather unfamiliar with them, and ille-

---

<sup>21</sup> As explained in Chapter 2, the species of trees is also of vital importance for A-P migrant birds (Acacia trees in particular) and people (including economically valuable and fruit producing trees). Thus, reforestation efforts should carefully select tree species. Notably, the *Faidherbia albida* tree is of high importance to birds (providing a good food source, including moths and caterpillars) and also highly valuable for people (as a multipurpose tree that is widely distributed in agroforestry parklands; Roupard *et al.* 1999; Zwarts *et al.* 2012). However, several other species are also valued by both birds and people, and retaining a diversity of species is probably important, because it benefits a greater diversity of bird species (Tews *et al.* 2004; MacArthur & MacArthur 1961). Tree density is also a crucial factor for (migrant) birds on farmland (Hulme 2007).

gal hunting was regularly observed.<sup>22</sup> Education could contribute to a better understanding. It does not mean, however, that conservation action should be entirely voluntary, and that law enforcement can be neglected. For example, even those who participated in conservation projects violated environmental laws.<sup>23</sup> The two concepts of law enforcement and awareness raising are not mutually exclusive, and both should be pursued (as some interviewees also suggested; see also Infield & Namara 2001).

### *Concluding remarks*

Law enforcement should be promoted by conservation organizations and (in particular by) governments, especially since a landscape approach is needed for the conservation of migrant birds. Conservation organizations do not have the capacity to work on sustainable land use and conservation practices with all the inhabitants of the Sahel. Nonetheless, as argued in this study, the involvement and participation of the local population is required as part of an integrated (A-P migrant) bird conservation and sustainable development effort. Working with COs, including LCGs, is only part of the participation solution.

I therefore argue that conservation organizations should focus on stimulating sustainable land-use practices through promoting favourable legislation, and land-use and economic policies. Government policies should take the local context and the influence of individual characteristics into account, which can be done through far reaching decentralization strategies. Conservation organizations should set an example and demonstrate the effectiveness and positive outcomes of their conservation strategies through a few local flagship projects. These should then be promoted so that best practices are integrated in (national) land use policies. The projects should preferably be located at 'Important Bird Areas', such as Sourou, where targeted efforts of conservation organizations are appropriate as they include bird and biodiversity hotspots. At the same time, awareness-raising among the public and enterprises should help to promote a general, more sustainable land use. International concerted action between governments, enterprises, conservation organizations, researchers, and local populations is also essential, as both (semi-)nomadic people and migrant birds cross borders, and the Sahelian landscape stretches far and wide over many countries. Knowledge, experiences and best practices should be shared between people and organizations as well as between sites and countries. This can be done through, among other

---

<sup>22</sup> Conservation legislation is well documented in Burkina Faso's national law, but implementation is weak and limited (although reportedly improving, including the attention given to migrant birds) (SP/CONEDD 2007; Lungren *et al.* 2001).

<sup>23</sup> Nonetheless, the people who were connected to conservation projects were generally more positive about bird conservation, suggesting that involving local inhabitants can produce significant improvements in conservation attitudes.



things, conferences, literature, social media, imagery and video, but also through exchange programmes that give people the opportunity to directly learn from each other and from the locality visited.

To conclude, the key factors to bridging the gap between bird conservation and sustainable development are:

- local perceptions (including needs and values, particularly about the importance of trees) and participation (partly through COs),
- awareness-raising and education (including in school),
- flagship projects (that include local benefits, long-term investments and local capacity building),
- promoting appropriate law (enforcement) and land-use policies (that are in consideration of local context and individual characteristics), and
- international concerted actions (with all actors involved in land use).

#### *Further research needed*

Much has already been published on integrated conservation and development projects (see e.g. Thomas 2013 and Roe 2006), but this study underlines that conservation and development actors regularly establish conservation actions without taking existing research and (local) knowledge into account (see also Thomas 2013). At the same time, this study indicates that ecological data is still limited and more research is needed, with a focus on understanding migrant birds' habitat requirements and how these are linked to land use and land-use changes (Adams *et al.* 2014; Atkinson *et al.* 2014).<sup>24</sup> Most importantly, this study highlights that all studies on migrant birds should include a clear description of the species, population, timeframe and geographical area, so that studies can be compared and the Sahelian driving factors behind declines revealed. Lastly, this study was mostly qualitative, so more quantitative follow-up research, including by means of surveys, could contribute to this study's findings. This would help quantify results and increase statistical analysis possibilities in order to draw more generic, region-wide, and general dryland-related conclusions and recommendations.

---

<sup>24</sup> Also knowledge of Burkina Faso's and the research areas' avifauna is limited and much information still needs to be collected or verified (BirdLife 2015c; Lungren *et al.* 2001).