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

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1 Introduction

A (research) project in the Sahel

The Sahel

The Sahel is a loosely defined and not well demarcated region; it comprises the semi-arid transition region between the Sahara Desert to the north and wetter regions of sub-Saharan Africa to the south (CSELS 2010; UNEP 2007; Agnew & Chappell 1999).[1] The Sahel region is often defined by means of the number of days of the growing season or by the average annual amount of precipitation. Alternatively, the boundaries have also been drawn using latitude and longitude (Agnew & Chappell 1999). However, the boundaries are gradual and arbitrary, changing in time following weather patterns (e.g. droughts), climate changes, and land-use changes and concomitant land-cover changes (Ton Dietz, director ASCL, *pers. comm.* 2015). Agnew & Chappell (1999: 300) argue that "it is normally taken to be the arid West African countries from Senegal to Chad, but some also include Sudan to the East" (Figure 1.1).

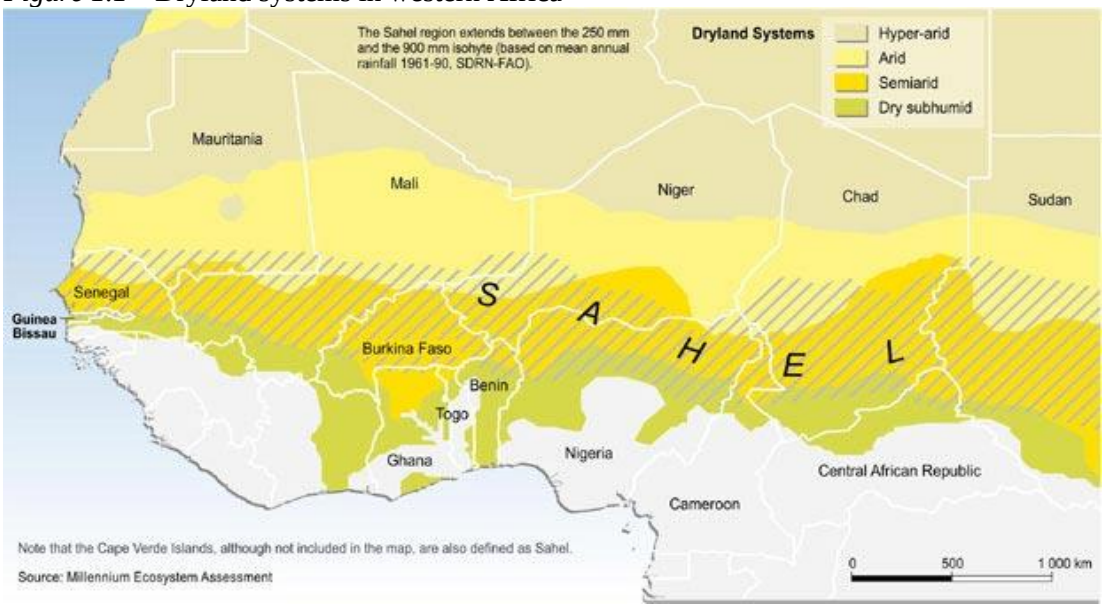
The Sahel region constitutes one major ecoregion[2] of the African continent (Brito *et al.* 2014). Different habitats can be found in the region, including large flat plains, gallery forests and sand dunes. The plains are mostly used for grazing and extraction of commodities (i.e. food, medicine, fodder and wood), and some smaller areas are also used for cultivation (increasing in area from north to south in the region) (Lykke *et al.* 2004). Traditional land-use practices such as nomadic pastoralism and agroforestry, as well as modern forestry rules, are adapted to the arid climate and erratic rainfalls (Zwarts *et al.* 2009; Mortimore & Adams 2001; Boffa 2000). However, this dynamic equilibrium is in jeopardy from increased agricultural and pastoralist activities, but also from overhunting, unsustainable

[1] "Due to the large contrast in the yearly rainfall, the West African landscape gradually changes from north to south, within a distance of 600–700 km from Sahara desert to humid woodland" (Zwarts *et al.* 2015).

[2] "Ecoregions are relatively large units of land containing a distinct assemblage of natural communities and species, with boundaries that approximate the original extent of natural communities prior to major land-use change." (Olson *et al.* 2001: 933)

extraction of natural resources and water overexploitation (irrigation and hydroelectric dams) (Adams *et al.* 2014; Brito *et al.* 2014; Zwarts *et al.* 2009).

Figure 1.1 Dryland systems in western Africa



Source: *Millennium Ecosystem Assessment* (2005)
The Sahel region is shown as the barred area on the map.

Most, if not all, Sahel countries' economies are strongly dependent on natural resources, but at the same time they are depleting their natural capital, making them exceptionally vulnerable (Cohen *et al.* 2011). Furthermore, agriculture and animal husbandry in the Sahel are highly vulnerable to climate change (Dietz *et al.* 2004). The region is home to a population of 100 million, and UN demographic projections for 2050 are 300 million. This rapid population growth coupled with environmental degradation and, at the same time a high dependence on the environment, is cause for grave concern. In 2012, 18 million people in the West African Sahel were suffering from malnutrition (Potts & Graves 2013). Indeed, the Sahel is sometimes labelled as one of the poorest and most environmentally degraded areas on earth (Brandt *et al.* 2014; CSELS 2010; Lindskog & Tengberg 1994).

The African continent is a winter ground for a quarter of the more than 500 bird species breeding in Europe, which includes between 2 and 5 billion individual birds. Especially the continent's northern savannas, including the Sahel region, serve as a wintering ground for migrant birds. Indeed, the Sahel is an important area for migrant European birds, both for those species that spend their winter here, and for those species wintering further south on the continent that

use this region as a staging area. These migrant birds are highly vulnerable to environmental change in the Sahel (Vickery *et al.* 2014; Zwarts *et al.* 2009; Jones 1995). Thus, environmental degradation in the Sahel is threatening the survival of both birds and people (Brandt *et al.* 2014; Ouédraogo *et al.* 2014; Cresswell *et al.* 2007).

The Living on the Edge project

In Sahelian West Africa, the integrated development and conservation project 'Living on the Edge' was developed and implemented by *Vogelbescherming Nederland* (VBN, i.e. BirdLife in the Netherlands) and *BirdLife International*[3] (BirdLife) between 2011-2015. This ambitious initiative aimed to improve living conditions in the Sahel for birds and people, by working with the local population to conserve and restore the natural environment and enhance livelihoods through a more sustainable use of natural resources. The Living on the Edge project follows the publication of an important book, from which the project borrows its title. This milestone publication analyzes land use, meteorology and demographics in combination with trends and the ecology of African-Palearctic (A-P) migrant birds[4] (Zwarts *et al.* 2009).

The Living on the Edge project was limited to the western Sahel region as shown in Figure 1.1, and had a focus on A-P migrant birds that winter in this region (VBN *in litt.* 2009). The project consisted of 12 site-based projects[5] in four 'Sahelian' countries – Senegal, Mauritania, Burkina Faso and Nigeria (Figure 1.2) – and programmes for exchange, advocacy, capacity building and communication, which enable these projects to serve as an example within the wider Sahel region. The project philosophy was based on existing successes of the BirdLife approach: addressing biodiversity and livelihoods issues simultaneously and at the grassroots level, and providing a connection to national and international processes and policies (VBN *in litt.* 2010).

The projects were implemented in each country by the local (BirdLife) partner organizations, and they collaborated with others who are active in the region, e.g.

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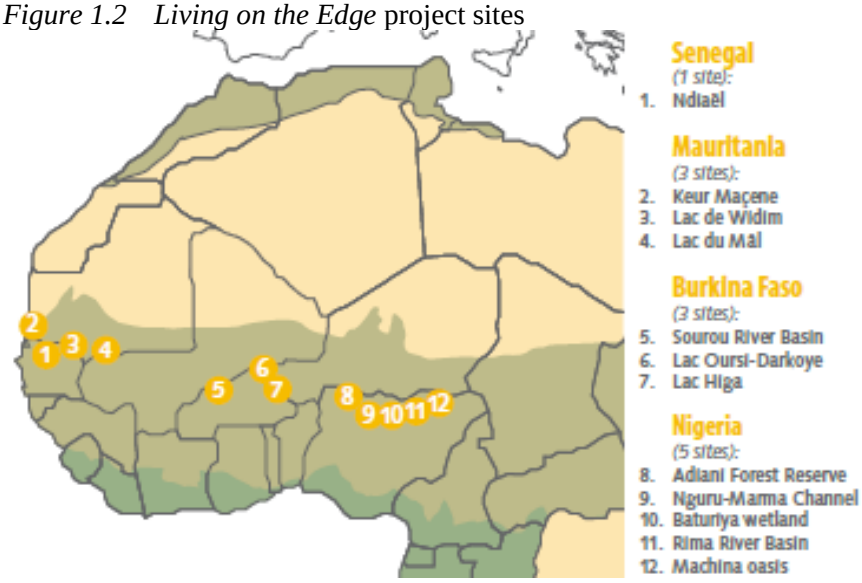
[3] BirdLife is a global partnership of 120 national non-governmental conservation organizations with a focus on birds. It is the world's largest partnership of conservation organizations and strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources (BirdLife 2015a; BirdLife 2000).

[4] "An A-P migrant is a species in which at least part of the population moves between breeding areas in the Palearctic region [Europe, Asia north of the Himalaya foothills, northern Africa, and the northern part of the Arabian Peninsula] and non-breeding grounds in sub-Saharan Africa each year" (Vickery *et al.* 2014: 2). Following this definition, 126 bird species can be regarded as A-P migrants, with between 2.1 and 5 billion individual birds involved each year (Vickery *et al.* 2014).

[5] One site in Nigeria consists of two neighbouring sites and is therefore sometimes considered two sites (Bernd de Bruijn, senior international policy officer at *Vogelbescherming Nederland*, *pers. comm.* June 2016). In that case, a total of 13 site-based interventions are distinguished, as is sometimes indicated (see e.g. Van den Bergh 2014).

Wetlands International. BirdLife had an important role in the project management. The local partner organizations are *NATURAMA* (BirdLife in Burkina Faso), *Nigerian Conservation Foundation* (BirdLife in Nigeria) and Nature Mauretanie (*L'Association Mauritanienne de Conservation de la Nature*). For several years, VBN has been supporting national BirdLife partners in West Africa, notably *NATURAMA* in Burkina Faso. A project in Senegal was being developed by *Dienst Landelijk Gebied*, in collaboration with *Altenburg & Wymenga Ecologisch Onderzoek B.V.*,[6] the *Direction des Parc Nationaux*, and the *Association inter-Villageoise de Ndiaël* (there was no BirdLife partner in Senegal at the time).

Figure 1.2 *Living on the Edge* project sites



Source: *VBN brochure 2011*

Local Conservation Groups (LCGs), also known as Site Support Groups in Africa, were responsible for the project's local execution and management strategy (VBN *in litt*. 2009; Figure 1.3). LCGs are "organisations or individuals who, together with relevant stakeholders, work with BirdLife partner organisations to help promote conservation and sustainable development" (BirdLife 2010a: 1).[7] BirdLife's (*in prep*.) newly formulated LCG vision reads as follows: "Whilst

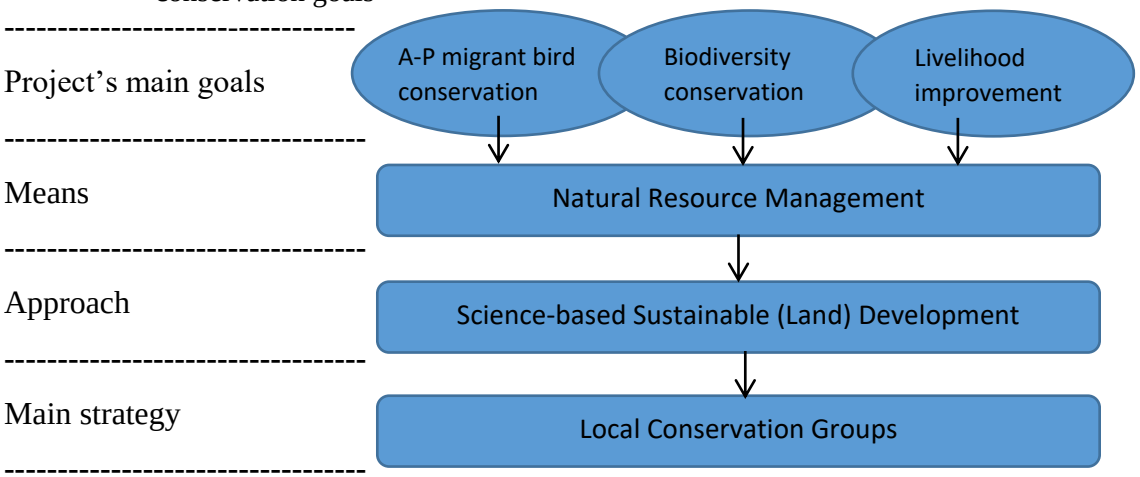
[6] *Altenburg & Wymenga Ecologisch Onderzoek B.V.* is a research and consultancy company in the field of ecology and related themes such as water, nature conservation and spatial planning. Note, (Eddy) Wymenga is also co-author of the book *Living on the Edge* (A&W 2010).

[7] "Members are usually volunteers and are typically drawn from the local community but may also include local authority representatives, business persons or other stakeholders. Where members look after 'their' local IBA(s) [Important Bird Areas], and include people from local communities, local branches of a BirdLife partner are also considered as LCGs" (BirdLife 2010a: 1).

your LCG strategy should link to your organization's mission, the LCG's activities should be driven by the interests, capacity and needs of the organisation's members and the wider community. It is important that they are self-motivated and have ownership of the activities they undertake".

BirdLife, the world's leading authority on the status of birds and their habitats (IUCN 2004), argues that conservation action should be based on sound science, and therefore proper research should precede conservation action. Besides building on earlier research, best practices and similar initiatives (BirdLife 2015b; Box 1.1), the project included additional research components as described in the next section.

Figure 1.3 Conceptual model of Living on the Edge project, which combines development and conservation goals



Research within the framework of the Living on the Edge project

Ornithological research was co-funded by the project and conducted by Dutch and British scientists, in cooperation with BirdLife partners, universities and institutes in the region. This comprised research on the distribution and movements, habitat use and limiting factors of A-P migrant birds, including the relation between migrant birds and land-cover changes.[8] In addition, monitoring under the Living on the Edge project, including by LCGs, provided information on

[8] For example, the Royal Society for the Protection of Birds and the British Trust for Ornithology conducted ecological field research in Ghana and Burkina Faso for the research project 'Drivers of Land Use Change Relevant to Migratory Birds in the Sahel'. The Sahel region in Burkina Faso was included in the field research. They used point count methodology and mist-netting as research methods. The researchers record migrants along a degradation gradient at five different stations on a north-south transect (http://migrantbirdsinafrica.blogspot.com/). A related research 'Land Use Change and African-Palaearctic Migrant Birds' was conducted in collaboration with the University of Cambridge (http://www.geog.cam.ac.uk/research/projects/landusemigrantbirds/).

habitats and their relevance to migratory birds. *Altenburg & Wymenga Ecologisch Onderzoek B.V.* contributed by conducting research on the importance of tree species to migrant birds (VBN *in litt*. 2010). In Burkina Faso, Adama Belemvire (director of EAC)[9] evaluated LCGs, and Nana Adama (*NATURAMA*) conducted socio-economic research at the LCG sites.

Box 1.1 A parallel initiative

A project titled The African Re-greening Initiatives (ARI) was created by the Centre for International Cooperation (VU University Amsterdam) in the period June 2009-June 2012. Some of the project's key activities are:[10]

1. Identify and analyze existing grassroots success stories in farmer-managed re-greening, and use these success stories as a starting point for expansion. ARI has developed a strategy for scaling up, including through farmer exchange visits and study visits.
2. Advocate for policy change. It is essential that farmers are granted exclusive rights to the trees (they protect and manage) on and off their farms. Therefore, ARI will lobby for national policies and legislation that support investments by farmers.
3. Use mass media, internet and other forms of communication to inform farmers and the wider public about success stories, results of farmer study visits and advantages of on-farm trees. A special project is being developed in cooperation with the Network Institute of VU University and the Web Foundation, called Web alliance for Re-greening in Africa (W4RA).

This current research focuses on the socio-cultural, socio-economic and institutional aspects of the project in Burkina Faso, predominantly including two of Burkina Faso's three LCGs, namely the Sourou LCG and the Higa LCG. For comparison purposes, and to place the Living on the Edge project in a broader context, similar interventions were also studied. In addition, the local population[11] and the development actors[12] active in the two LCG areas were also included in the study, as well as development actors with similar activities in other areas in the country. Furthermore, ecological aspects, including changes in land use and land cover, and their (potential) impact on A-P migrant birds are also discussed. It connects this with integrated conservation and development concepts.

Field research was conducted between July and September 2011; between December 2011 and March 2012; in February/March 2013; between February and

[9] Études Action Conseils (EAC) is a research consultancy firm based in Burkina Faso. It undertakes research on Africa in the humanities and social sciences.

[10] See also Reij (2010) and The African Re-greening Initiatives (2010).

[11] In this study, the local population refers to all people living in a particular area (e.g. in Sourou and/or Higa), with two exceptions: excluding development actors as, in practice, they all live temporarily and often for (very) short periods in the area and do not directly depend on the area's natural resources for their survival, but including (semi-)nomadic people as they depend (directly) on the area's natural environment for their subsistence livelihoods.

[12] In this study, development actors refers to government officials, NGO staff, employees of companies engaged in sustainable agriculture (bio-agriculture) and/or socially responsible (social) business.

April 2014; and again in April 2015. Due to negative travel advice for northern Burkina Faso in 2013, I was not able to travel to Higa in that year. Instead, Achille Ouédraogo, a biology Master's student at the University of Ouagadougou, conducted several interviews in Higa between 10-13 March 2013 (that is after he had already acted as my research assistant; see also Table 1.1). In addition, Achille Ouédraogo conducted PADev-inspired (Participatory Assessment of Development) exercises in Sourou in April 2015.

Study areas

Burkina Faso was selected for this study because of its Living on the Edge project sites, the connected research agency (EAC)[13] and BirdLife's national conservation partner *NATURAMA*. In addition, the country was relatively stable politically and the security situation was considered acceptable at the time when the research project was being designed. Two of Burkina Faso's three Local Conservation Groups (LCGs) – Sourou LCG and Higa LCG – were selected. The country's third LCG in Mare d'Oursi (Oursi LCG) falls within the Sahel biome area but was not studied due to local security concerns (there was a travel warning issued by, among others, the Dutch Ministry of Foreign affairs). However, interviews were conducted with the former LCG president during his visit to the Higa LCG.

The studied LCGs are located in the Sudanese-Sahelian climatic zone and Sahelian climatic zone, respectively (Figure 1.4). Both climatic zones are considered to be part of the Sahel region in this study, similar to that of the Sahel region as shown in Figure 1.1. The areas covered by the two studied LCGs included two so-called Important Bird Areas (IBAs):[14] the Lake Sourou IBA (hereafter referred to as Sourou) and the designated Lac Higa IBA[15] (hereafter referred to as Higa). Both areas are included on the Ramsar list of wetlands of international importance.[16] Sourou (ca. 22,000 ha) is in both Lanfiera Department (12 communities) and Di Department (13 communities) in Sourou Province in the northern part of the Sudanese-Sahelian climatic zone near Burkina Faso's north-western

[13] Études Action Conseils (EAC) is a research consultancy firm based in Burkina Faso. It undertakes research on Africa in the humanities and social sciences.

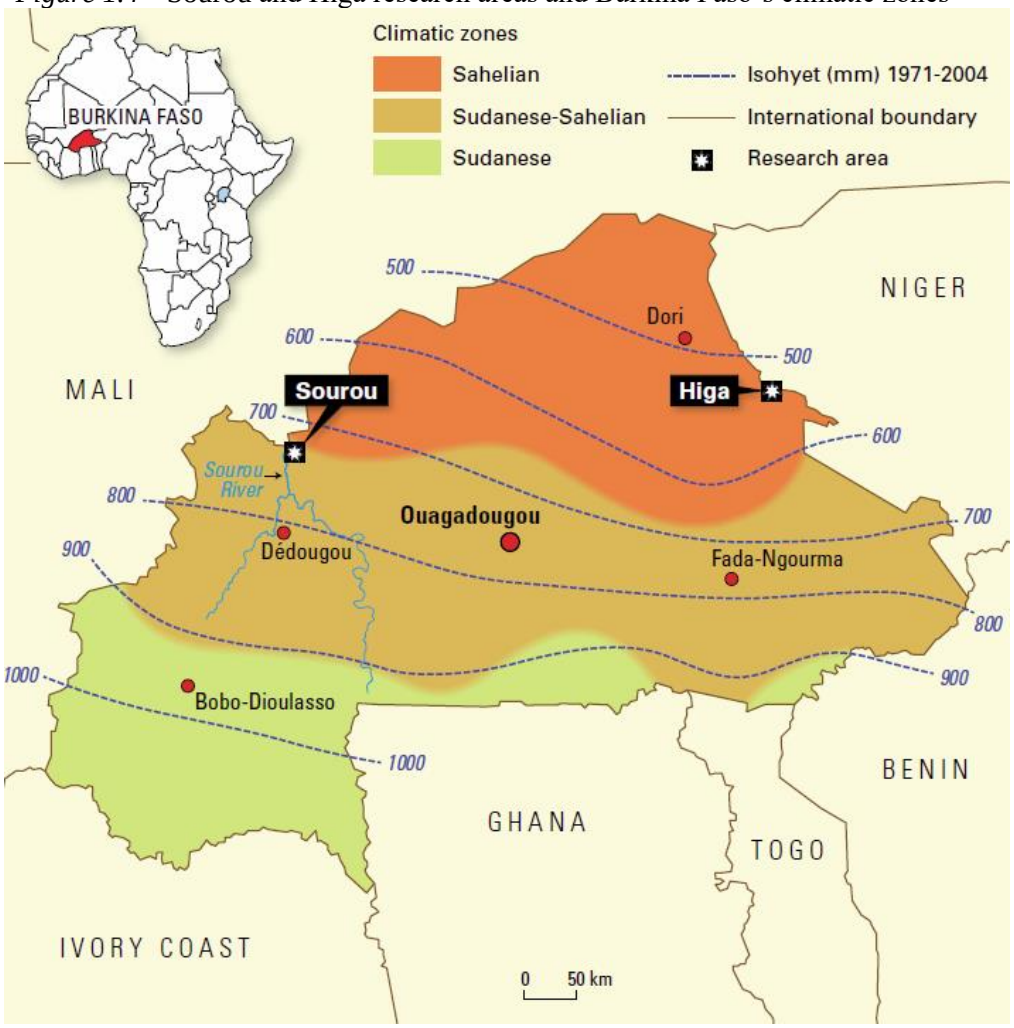
[14] Important Bird Areas "are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network. They do one (or more) of three things: a) hold significant numbers of one or more globally threatened species, b) are one of a set of sites that together hold a suite of restricted-range species or biome-restricted species, c) have exceptionally large numbers of migratory or congregatory species" (BirdLife 2010b).

[15] Higa LCG's area of operation officially encompasses the whole of Tankougounadié Department (102,300 ha) but is, in practice, limited to the Tankougounadié community of the same name and the IBA area. Higa refers to these areas in this paper.

[16] "The Ramsar Convention is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories" (Ramsar 2010).

border with Mali. Higa (ca. 1,500 ha) is in Tankougounadié Department (13 communities) in Yagha Province on the southern edge of the Sahelian climatic zone near Burkina Faso's north-eastern border with Niger (Ramsar 2013; Fishpool & Evans 2001). Including these two research areas for comparison purposes seemed valuable as the two areas differ in many ways (see Chapter 3 and Van den Bergh 2014).

Figure 1.4 Sourou and Higa research areas and Burkina Faso's climatic zones



Source: Adapted from *Atlas de l'Afrique 2005*

These differences were the principal reason for selecting these research areas, as they represent two different Sahelian, as well as two different conservation settings. Some of the key differences include: remote versus less remote; developed versus less developed; numerous sustainable development interventions versus few such interventions; wet Sahelian landscape versus dryer Sahelian landscape; a diversity of livelihood activities versus a predominantly (semi-

nomadic) farmer-pastoralist population; and so on (for a more detailed discussion see Chapter 3). In Sourou, bird conservation activities were regular and a local LCG was active here since 2003 (formally 2007). In Higa, no bird conservation activities did (yet)[17] exist and a local LCG was only established in 2009 (formally 2010). Both Sourou and Higa have an extensive area with surface water (a river and a lake, respectively), which might make these areas somewhat atypical in the context of Sahelian landscapes. However, many people in the Sahel live near areas with extensive (although often seasonal) surface water, such as lakes and rivers (Ton Dietz, director ASCL, *pers. comm.* 2016). Moreover, the heterogeneity of the Sahel is marked, with differentiated local combinations of natural, social, technical and economic characteristics (Raynaut 2001; see also Chapter 2).

Most of the development actors that were included in this study were based in two of Burkina Faso's main urban areas, namely, the country's capital Ouagadougou and the country's second largest city Bobo-Dioulasso. On some occasions, depending on the actors' activities and office locations, research was conducted outside these particular areas and carried out in rural or other urban areas.

Research objective and questions

The main objectives of this study are to uncover the local values of birds, the environment and conservation for rural people[18] in the Sahel, and to increase insights into interventions that aim to achieve integrated (migrant bird) conservation and sustainable development objectives in this area. It covers a region that is underrepresented in existing publications and highlights several thematic areas that warrant further research and debate. By focusing on issues like local perceptions,[19] local institutional arrangements and the role of birds, this study adds new insights to the existing literature and insights. The links between conservation and livelihood concerns remain much debated, and there is no agreement about the degree to which these concerns are linked, and how they should be tackled together (Christensen 2004; Sheil *et al.* 2003). In addition, to design sustainable (bird) conservation and land management strategies, it is vital to determine the symptoms and causes of environmental degradation through both scientific data and literature, as well as through local perceptions (Lindskog & Tengberg 1994). Hence, the study's main research question is as follows:

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[17] The LCG Higa conducted its first bird conservation activity in 2012, namely, a bird-monitoring training for a few of its members.

[18] Scoones (1998: 17) indicates that "rural and urban livelihoods are clearly intertwined, and the rural distinction is somewhat artificial." In this study, the distinction between the rural and urban population is also somewhat artificial and flexible, but principally refers to those people living outside the major cities in areas where the vast majority of inhabitants have subsistence livelihoods.

[19] I.e. the perceptions of the local population.

How can (migrant) bird conservation and local sustainable development objectives be successfully integrated and implemented in Burkina Faso's Sahel region?

The human inhabitants of the Sahel are strongly connected with their environment and the participation of these local inhabitants in the Living on the Edge project – and similar integrated development and (bird) conservation efforts – is often regarded as important or even essential (Adams *et al.* 2014; Cohen *et al.* 2011; Dietz *et al.* 2004; Raynaut 2001; Roe *et al.* 2006; Ribot 1999; Zwarts *et al.* 2009). However, following, among other things, insufficient conservation results from community-based projects, the involvement and role of communities appears to be uncertain (Dzingirai 2003). Therefore, existing policies need to be debated and validated by stakeholder groups, including local populations (Diallo *et al.* 2012). Perhaps most importantly, local needs, attitudes, and aspirations, and thus local perceptions, need to be better understood (Owusu & Ekpe 2011; Lindskog & Tengberg 1994). Particularly, the currently understudied livelihood perceptions from outside protected areas need to be explored (see e.g. Tessema *et al.* 2010; Infield & Namara 2001; Gillingham & Lee 1999). There is also a need for community-based conservation data that include more than one specific type of livelihood or resource domain, thus obtaining a more holistic livelihood view (Brooks *et al.* 2013). Even less is known about the (potential) role of (migrant) birds in these issues, despite the fact that birds are an excellent indicator of environmental health and conservation issues (BirdLife 2015b). Thus, the inhabitants' perspective on, and their understanding of, these subjects – thereby uncovering the relation between inhabitants, the environment, and birds – is an important element in the study, and this is the objective of Chapter 4 (Local Perceptions of Birds, the Natural Environment and Conservation in Burkina Faso's Sahel region). Because the information is directly derived from the inhabitants themselves, who know what is important to them, this study could contribute to successful and effective conservation that simultaneously contributes to livelihood improvement.[20] Moreover, increased knowledge on the interaction between local populations and the environment could help direct conservation efforts to tackle the true causes of environmental degradation (Lindkskog 1994). This leads us to sub-question 1:

How are the natural environment, birds and bird conservation perceived by the local population, and *how can understanding local perceptions contribute to the integration of bird conservation and local sustainable development objectives*?

[20] The research tries to determine if and how birds and the environment contribute to inhabitants' livelihoods and welfare. This information can be used to stimulate the conservation of birds by making (other) inhabitants aware of the mentioned advantages. On the other hand, conservationists can try to invalidate the, perhaps wrongly, assumed disadvantages of birds and conservation and thus contribute to a more positive attitude towards (migrant) birds among some local inhabitants.

Similarly, increased knowledge on the interaction between local populations and development actors could help us understand the 'gap' between theory (i.e. development policy) and practice (i.e. project implementation) (Mosse 2004). Mosse (2005 & 2004) argues that development actors are preoccupied with generating the right policy models, although, rather than being driven by policy, development practice is shaped by the actors' relationships and interests and cultures of specific organizational settings. Policy discourse generates metaphors such as 'participation', of which the "vagueness, ambiguity and lack of conceptual precision is required to conceal ideological differences, to allow compromise and the enrolment of different interests, to build coalitions, to distribute agency and to multiply criteria of success within the project system" (Mosse 2004: 663). Chapter 5 (The Social Interface of Sustainable Development Actors and the Rural Population in Burkina Faso. Who is in Charge?) examines the effectiveness of collaboration between development actors and the local population in these participative conservation projects. Its objective is to increase insights into conservation and sustainable development interventions in the Sahel, in particular regarding the interaction between development actors and local populations. It looks at the (potential) gap between participation policies and practice (i.e. how and to what extent local populations participate in sustainable development projects) and pays close attention to the perception of the local population. In this way, the study addresses sub-question 2:

> How does collaboration between development actors and the local population take place and how is it valued by the local population?

Furthermore, empirical data is required in order to derive the best local institutional arrangement (Benjamin 2008; Ribot 2003). Global trends toward democracy and decentralization have also reached developing countries. Many developing countries have also decentralized some aspects of natural resource management (Benjamin 2008). Benjamin (2008: 2255) indicates that "much recent work on decentralized natural resource management has focused on the institutional arrangements that shape the balance of powers between central and local governments. It has given comparatively less attention to relationships between local government and community-level institutions."[21] This study included extensive research on this knowledge gap, the results of which are discussed in Chapter 6 (The Role of Community Organizations in Integrated Conservation and Development Projects: Local Perspectives from the Sahel Region). The chapter's objective is to increase insights into local institutional arrangements by focusing on

[21] Benjamin argues that the (ambiguous) relationships between legal institutions and community institutions can undermine both the authority of local governments and the performance of customary institutions (Benjamin 2008).

the functioning of local community organizations, including their external (conservation-related) relationships. It addresses sub-question 3:

> How do local organizations (local conservation groups and other community organizations) function in relation to conservation and local participation?

By addressing these questions and increasing our understanding of these interrelated topics, the study aims to contribute to successful (migrant bird) conservation and sustainable development efforts in the Sahel (and other drylands). Successful here means that local inhabitants participate in, and gain from, these efforts because they address local needs and aspirations. This study provides information, examples, and conclusions on the (perceived) relations between (migrant) birds, the environment, and integrated conservation and sustainable development efforts, as well as specific recommendations for development actors (including conservationists) in Chapter 7 (Conclusions).

First, however, the research methodology will be introduced in this introduction chapter (Chapter 1. Introduction). Chapter 2 (Land use, Migrant Birds, Conservation and Sustainable Development in a changing Sahel) provides a literature review on the subjects of land use (including vegetation cover trends), A-P migrant birds, and conservation and sustainable development in the Sahel. In Chapter 3 (Land use, Migrant Birds and Conservation in a changing Burkina Faso and the Research Areas), the research areas will be introduced, including a description of the human population, land use, vegetation cover trends, A-P migrant birds, and conservation in Burkina Faso and the research areas.

Research methodology

A broad range of research methods and sources were used for this study, including written sources, remote sensing data, interviews, observations, and workshops. This provided a great diversity of information that allowed a more holistic view of the many interrelated researched topics. Yet, field research was the study's fundamental data source, in particular interviews with the local population, as their perception on the research topics is the focus of this study. However, development actors were also an important study group because of their integrated (bird) conservation and sustainable development efforts. All development actors studied had (ecologically) sustainable (livelihood) development objectives. The conservation-oriented actors were also considered development actors in this study, as all these actors also had sustainable development objectives. The development actors included conservation and development NGOs, bio-agriculture and social businesses, and government organizations as their participation and decision-making in natural resource management is important (Raynaut 2001).

Extensive literature research was conducted for all research topics, and particularly for ecological aspects (Chapter 2). The principal field research method consisted of individual and group interviews, chiefly in the two rural research areas (Sourou and Higa) and two urban areas (Ouagadougou and Bobo-Dioulasso). These included semi-structured in-depth interviews with national and international sustainable development actors, as well as with local inhabitants. Other research methods included participation in workshops (Chapter 2), the analysis of remote sensing data (Chapter 3), PADev (Participatory Assessment of Development) exercises (Chapter 5), website examination (Chapter 5), reading of documents (Chapter 6), expert consultations, and participant and field observations.

The book consists of seven chapters of which three are in journal article style (Chapters 4, 5 and 6), including one chapter (Chapter 6) that has already been published. For this reason, the research methods are repeated and further described in each of these three chapters.

Research methods

Written sources

Literature research

An extensive − primarily English, and to a lesser extent French − literature examination was conducted for all chapters. Most literature was collected through online search engines (principally Google Scholar and the African Studies Centre Leiden library catalogue), but much literature was also provided by colleagues, library staff, fellow researchers, and others. Other search methods and sources included references in literature, conferences, and several (other) libraries.

Reading of documents and website examination

Close reading of documents of (local) organizations and (local) governments provided information on the functioning and statutes of these organizations. An examination of the development actors' websites provided useful information on local collaboration policies (see also Ybema *et al.* 2009). Notably, the mission statements (or similar section) on the websites of thirty development actors were scanned for possible references to local involvement, and in particular references to decentralization, participation, and empowerment (policies).

Remote sensing data

For the analysis of remote sensing data, four points were selected in the rural research areas for vegetation and rainfall trends analysis. To include both dry Sahelian sites and surface water rich Sahelian sites, two points were selected adjacent

to the river and lake in Sourou and Higa, respectively, and two points more than five kilometres away from these water sources. Vegetation trends were analyzed by means of 10-daily composites of the Normalized Difference Vegetation Index (NDVI) derived from the Satellite Pour l'Observation de la Terre (SPOT)-VEGETATION time series (1998-2014).[22] Rainfall trends were analyzed by means of 10-daily Climate Hazards Group InfraRed Precipitation with Station (CHIRPS) data for the same period (Funk *et al.* 2015). The NDVI SPOT-VEGETATION and CHIRPS data were provided by Dr. Anton Vrieling (University of Twente), who also assisted with the analysis.

Interviews

Semi-structured in-depth interviews

For this study, 241 people were interviewed. Semi-structured in-depth interviews were held in each rural research area with government officials, development actors, community and religious leaders, semi-randomly selected local inhabitants, the board members (presidents and/or secretaries) of community, cooperative,[23] and union organizations, and with the presidents and secretaries of the Sourou and Higa LCGs, as well as with several of their members (169 interviewees). In addition, in the urban research areas (chiefly Bobo-Dioulasso and Ouagadougou) interviews were also held with development actors (72 interviewees). Many of the interviewees were interviewed on several research themes during one, two, or three interviews, and the data from the analysis of their interviews was used for more than one chapter.

Among the development actors were government officials, NGO staff, bio-agriculture and social business employees. Community organizations (COs) refer here to locally-based non-state institutions and exclude LCGs so that this specific type of COs can be compared to other COs. The selection of the COs was made according to each organization's main characteristics (gender focus, activities and goals) in order to get a good selection of the broad range of COs present in the two areas, but with a particular focus on land-use oriented organizations. Semi-randomly selected local inhabitants refer to a selection of the local population that aims at representing the diversity found among the population, and particularly regarding people's occupation (i.e. land use activities) in an attempt to uncover the different perceptions regarding the research subjects. There were no population statistics available that included such variables as people's religion,

[22] An envisioned comparison of tree density between historic and recent very high resolution satellite or aerial images of the research areas (in order to establish changes and trends) failed due to a lack of high resolution historic images in which trees are clearly visible (Leo Zwarts, independent researcher, *pers. comm.* 2015).

[23] No cooperative organization was found in Higa.

ethnicity, or occupation.[24] The selection was made by approaching inhabitants in their homes or fields, on the road, or at local markets. Informal interviews revealed that essentially four types of occupations could be found among the population in both research areas, namely fisher, farmer, farmer and pastoralist, or another combination. Care was taken to ensure that all occupation types were included in the selection; for instance, by visiting small islands that are inhabited by fishers so as to include fishermen (see also Photos 1.1 and 1.2). The following characteristics were noted for each interviewee from the local population: gender, age, place of residence, ethnicity, religion, marital status, number of children, education level, literacy level, French speaking/writing, main livelihood activities, (farm) land ownership, livestock ownership, (board) memberships in community organizations, and (board) memberships in LCG.

Individual interviews and group interviews aimed to achieve an in-depth general understanding of their activities, values, relations and perceptions, among others. The goal was not to obtain exact numbers and statistics from the interviewees. Semi-structured in-depth interviews were therefore used, and the analysis of the interviews is thus mostly qualitative (see also Bernard 2011 and Robson 2002; only in Chapter 4 are quantitative analyses also included). A conversational style was adopted during the interviews by using a research questionnaire as a guideline and checklist (Annex 1.1).[25] This semi-structured approach allowed freedom in the sequencing of questions and in the amount of time and attention paid to each particular question. Some questions proved unsuitable with particular interviewees, while additional questions were included in some interviews when needed (Robson 2002).[26] In addition, some freedom was given to the interviewees regarding the exact discussion topic. The purpose of this interview style was to bring unknown issues to light and to discover what the interviewees think are important issues and topics. One result of this conversational style was that there was often no time to deal with all the questions on the questionnaire (read: the interviewees were reluctant to spend more time on the interviews). This is reflected in the diverse numbers of interviewees for each research theme (particularly in Chapter 4). The differences between the research areas were amplified due to a negative travel advice for northern Burkina Faso in 2013.[27]

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[24] Hence, it is not possible to establish whether ratios of such variables in the selection are representative of those in the populations of the two rural research areas.

[25] BirdLife's guidelines (BirdLife unpublished data, a-e) were consulted, as well as researchers (including my PhD promotors) and conservationists (including BirdLife employees), among other sources. In addition, trial interviews provided useful feedback that was incorporated in the final research questionnaire.

[26] Also, an extra explanation was sometimes needed and provided.

[27] Due to a limited general selection size, and one that is particularly small for several research themes, it was not always possible to statistically assess the influence of interviewees' characteristics and/or the local context on interviewees' perceptions.

I always used one research assistant[28] in each of the two rural research areas and sometimes in the urban research areas as well (Table 1.1). These assistants functioned as interpreter during the interviews. Many inhabitants of Sourou and (especially) Higa, did not speak French (or English), and during these interviews the interpreters translated the responses from a local language to English. The local languages included, starting with those most frequently used, Mooré, Dioula (especially in Sourou), and Fulfulde (especially in Higa). The interviews with the development actors took place in either French or English. I did not make any audio recordings of the interviews; instead, I made thorough notes with use of a pen and paper. As an interpreter was often needed to communicate I usually had ample time to make notes. Most interviews lasted between 1-3 hours, the lengthy ones were broken up by a short break. We always used a private and/or quiet place for the interviews, often in the field or at someone's home, so that we were not interrupted or distracted and the interviewee could speak freely. For similar reasons, women were interviewed separately from men, as they might speak more freely without the presence of men. Besides, women might think differently on subjects and might have different roles in several respects.

Twenty-eight group interviews were carried out. As Robson (2002: 284-285) highlights, group interviews have several advantages: i) "natural quality controls on data collection operate; for example, participants tend to provide checks and balances on each other and extreme views tend to be weeded out"; ii) "participants are empowered and able to make comments in their own words, while being stimulated by thoughts and comments of others in the group"; and iii) "contributions can be encouraged from people who are reluctant to be interviewed on their own, feel they have nothing to say or may not usually participate in surveys". The 28 group interviews consisted either of two interviewees (18) or of three interviewees (8), thus 60 interviewees in total. According to Robson (2002), opinions on the optimum size of interview groups varies, but groups of 8 to 12 persons are usually thought to be suitable. I chose to keep my groups sizes much smaller, because larger groups tend to be dominated by the more talkative persons were only heard (attested to by my experiences in the trial interviews; see section on 'Reflections' below).

The interview notes were processed after each fieldwork period in the software programme 'Microsoft Excel', thus I went through all the notes and categorized all the responses in Excel sheets. Categorization was done according to content as well as interviewee's characteristics. In this way, a workable overview was created of all the responses, and in such a way that comparisons could easily be made.

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[28] I selected them on the basis of their familiarity with the research topics, willingness to stay in remote villages, and their language and social skills (see also Table 1.1).

Table 1.1 Research assistants

	University of Ouagadougou	Languages	Ethnicity	Religion
Idrissa Ouédraogo	Master's Animal Biology[1]	Mooré, Dioula, French, English	Mossi	Muslim
Achille Sougrinoma Ouédraogo	Master's Animal Biology[12]	Mooré, Dioula, French, English, Fulfuldé (basic)	Mossi	Christian
Ibrahim Compaoré	Bachelor's English	Mooré, Dioula, French, English	Mossi	Christian

Note 1: At present a PhD student.
Note 2: Member of Teaching and Research Unit of Life and Earth Sciences.

Informal interviews

During my fieldwork many informal conversations were held with various people, especially with local inhabitants (and most extensively with my host families, see also 'Reflections'). These conversations uncovered interesting topics, behaviours, and thoughts, and led to a better understanding of local cultures, customs, and practices (see also Ybema *et al.* 2009), and therefore played a valuable part in the research (Robson 2002). The informal interviews were all unstructured interviews; they mainly consisted of small chats, but some were conversations of considerable duration (up to more than an hour). The subject of each informal interview differed greatly, and they covered almost all aspects of the research. I usually did not make any notes during the informal interviews,[29] because this would have ended any spontaneity and informality (*Ibid.*). I did, however, make detailed notes as soon as possible afterwards.

Expert consultations

Many researchers, policymakers, and conservationists were consulted for this research. They provided feedback on the text, references to debates and literature, and insights and discussion on research topics, as well as sharing their personal experiences, observations and ideas.

[29] With the exceptions of a few informal interviews; especially lengthy interviews and/or those that provided much detailed information.

Photo 1.1 A one-day visit to an island in Sourou

Photo 1.2 An interview with a local inhabitant in Higa

Inhabitants were often approached in the field to include, for example, (semi-)nomadic herders. Similarly, a small village on an island was visited on several occasions to include fishermen (and to make observations of their activities).

Observations

Participant observations

Participant observations, in which 'first-hand' experience and exploration were key, were garnered from 22 negotiation processes and other interactions between local inhabitants and development actors. These interactions lasted between 30 minutes to three days, and included stakeholder meetings, joint project activities, job trainings, and policy, project and sales negotiations (see also Ybema *et al.* 2009). The purpose of these observations was to determine which actors lead and direct the conversation, do most of the talking, and to what extent they speak freely and give their opinion. Understanding these processes and the different roles played by the different actors is important because "the notion of negotiation is essential in the setting up of 'sustainable' relations between the different types of users and the environment" (Raynaut 2001: 18-19). Ribot (2003) and Benjaminsen (2000) argue that the communities' role in natural resource management depends greatly on the negotiation power of individual local organizations.

In addition, I participated in a two-day long LCG bird monitoring training and a one-day tree-planting activity, and joined four LCG meetings. These observations provided a good impression of the functioning of the LCGs and the exact role of their members (see also Photo 1.3).

Field observations

During the entire field research period, observations and notes were made of potentially interesting activities and conditions, such as (the lack or presence of) bird hunting and land use activities. Often, the first and/or last hour(s) of a day were used for birdwatching. During these walks, notes and photographs were made of A-P migrant bird(s) (sightings) in particular. I have described and published several new and notable bird records for Burkina Faso, including A-P migrant birds (see also Van den Bergh 2013, 2012).[30]

[30] In addition, I was co-editor, co-producer and scientific advisor for the documentary 'Living on the Edge', which was produced by *Vogelbescherming Nederland* in the context of the Living on the Edge project. It was broadcasted on Dutch national television (300.000 viewers, and increasing during the broadcast), and an English and French version was distributed among the many project partners (and shown to the LCGs). To view the movie trailer, see:
https://www.youtube.com/watch?v=JDhIQqTjKIE.

Photo 1.3 LCG members participating in a bird monitoring training in Higa

Valuable information about the functioning of LCGs was gathered by joining them on their activities, such as a bird monitoring training.

Workshops

PADev (Participatory Assessment of Development) workshops

PADev is a participatory and holistic methodology for evaluating development interventions. Information about changes in six domains (natural, physical, human, economic, socio-political, cultural) and the impact of interventions is gathered in workshops in which all layers of the local society participate (Dietz & the PADev team 2013).

In both Sourou and Higa, two PADev (try-out) workshops were held with one women's and one men's group (3-5 persons each) in 2011-2012. The principal aim of these workshops was to obtain an impression of historical events and the changes in the area over the last decennia, based on the value systems of the population (see also *Ibid.*). The participants were asked, in turn, to mention a major past event until no one could mention any other event (some further details were sometimes asked, such as how the event impacted their lives). An overview of historical changes was created through a group discussion of several domain-related themes for each of the six domains set out in the PADev guidebook (see *Ibid.*). Other PADev exercises were included through an exploration with the participants; due to the limited time that people had available for the workshop, they only provided short answers and feedback on all the main exercise themes (see Annex 1.2 for some additional details). As it proved difficult (for a solitary

researcher) to find participants willing to complete a (multiple day) PADev workshop[31] it was decided to limit these comprehensive workshops to two in each research area.

Instead, in Sourou, 15 PADev-inspired focus workshops were held in 2015 with 33 participants, divided into nine individual and six group (2-6 persons) workshops. Due to security concerns in Higa in 2014-2015, it was decided not to organize any PADev-inspired focus workshops in the area. Due to similar concerns, a Burkinabe research assistant (see section 'Research within the framework of the Living on the Edge project') conducted the PADev-inspired workshops in Sourou. Workshop participants included board members of COs, religious leaders, and semi-randomly[32] selected inhabitants. The focus in these workshops was on the PADev 'assessment of actors' exercise, which was used to discover participants' perceptions of interventions and the actors working in the area. In the PADev-inspired exercise, participants were asked to assess the actors working in the area based on various statements, which are considered criteria in this study (see Chapter 5, the section on 'Methods').

It has been observed that "exercises employing the use of stones generated a lot of discussion and engagement among participants because there was an element of 'fun' about them" (Dietz & the PADev team 2013: 18). This exercise type was adapted to maximize the input of all participants. The group was given 30 stones and was asked to score each criterion by placing between 1-5 stones next to each criterion on a sheet of A1 paper (see Photos 1.4-1.6). Participants discussed the number of stones for each criterion until consensus was reached within the group.[33]

Cambridge Workshops

In 2010, I participated in a multiday workshop organized by the University of Cambridge, the Royal Society for the Protection of Birds and the British Trust for Ornithology in 2010. Participants (scientists and conservationists) worked together to produce a prioritization of the most critical land-use changes in the Sahel (see also Cambridge Workshop 2010).

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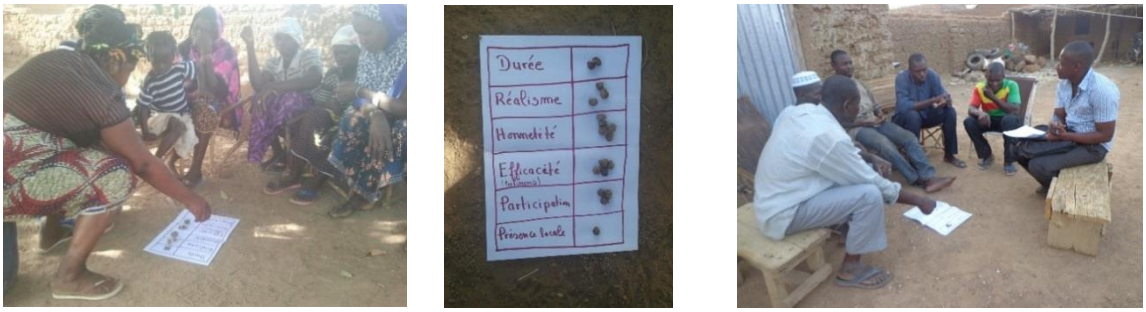
31 Besides, some specific modules would yield more valuable data for this study than others.

32 They were selected in a similar way as the semi-randomly selected interviewees (see section 'Semi-structured in-depth interviews' for details)

33 According to the PADev methods, participants should respond to the statements by indicating either that they apply 'always', 'usually', 'sometimes', 'usually not', or 'never', thus providing each criterion with a score from 5 ('always') to 1 ('never'). In this study, these scores were often taken as a way of grading, and following their responses could generally better be interpreted as 'very much so', 'much so', 'neutral', 'not so much', and 'not at all'.

Photos 1.4-1.6 PADev-inspired focus workshops in Sourou



Women (left) and men (right) participating in a workshop, and a sheet of A1 paper on which stones are placed by the participants to score each criterion. Photos by Achille Ouédraogo.

Reflections

An initial field research with a strong explorative component was conducted between July and September 2011. The research areas were explored and many informal interviews were conducted to validate or adjust the proposed research where needed. Proposed research methods were also tested to see whether the planned procedures worked out as envisioned (see also Chenail 2011). Although the research questionnaires were composed prior to the field research, they were adjusted after several trial interviews and discussions with local key-actors (such as mayors, board members of community organizations and local government employees). Similarly, trial PADev workshops were held. Such trials allowed me to test, for example, whether the group sizes were suitable, whether the questions and methods were appropriate, and whether any important ones were missing.[34] During my field research in the two rural research areas I always stayed overnight with local families, usually with the same families. This allowed me to make many community observations and conduct countless informal interviews (particularly with the host and hostess and their family and friends).

My presence as a researcher could have intruded on the setting or altered people's responses (Merriam *et al.* 2015). Indeed, one should be aware of the potential influence of my presence during, for example, observations of interaction between development actors and local inhabitants, which might stimulate, what is thought to be, appropriate negotiation behaviour. However, due to my often extended stay with the participants, my presence was less peculiar in the negotiation processes. The interactions appeared to be natural and people demonstrated relaxed postures. Something similar can be said for the interviews, as participants readily entered into dialogue and shared personal information, suggesting that

[34] At the end of each interview, I asked the interviewees whether there was something I had not asked and/or if they would like to tell me something that they thought would be important for me to know (which happened on several occasions).

they felt comfortable with me and my research assistants (see also Sword 1999; Ybema *et al.* 2009). My extended stays with local families during my field research allowed me to win the inhabitants' trust and make them feel comfortable with my presence (Merriam *et al.* 2015).

That said, my (prolonged) presence, including often being associated with the LCGs, potentially influenced people's behaviour and responses. However, I always introduced myself as social scientist researcher conducting unbiased research for a Dutch (or European) university on the relation between local inhabitants, the environment, and development actors (governments, organizations, etc.). Questions related to people's characteristics and their livelihood activities were asked first, while bird and conservation related questions were asked and discussed last. I always assured the interviewees that their information would be treated anonymously and that they would not be held accountable for their responses. Interviews were conducted in a quiet, often private location, without other people around. I am convinced that people felt confident to speak freely. For instance, some people asked me to help them to get rid of small birds that feed on their crops, while others initially thought I was talking about domestic birds (note: only after the first question about birds did I clarify, if necessary, that I was referring to wild birds). Also, many interviewees shared personal information. Moreover, many local inhabitants did not know of the existence of an LCG nor of *NATURAMA*. When still in doubt about whether an interviewee's response was unbiased, I asked for explanations, argumentation and/or more details regarding their response, or I formulated the question differently to ask it once more. A similar strategy was adopted for dealing with seemingly conflicting information given by various groups of stakeholders. It usually turned out to be a difference in perception between the interviewees, or otherwise it illustrated an existing disagreement between different actor groups.

I also had to be mindful of generating biased information through the interpretation of interviewees' responses and perceptions, especially given my frequent use of an interpreter. To limit an interpretation effect, I processed information immediately by making direct notes. Particularly in cases of unusual or unanticipated answers, I expanded on my understanding of their responses, including by summarizing their answers. I then asked them to comment on my interpretation of their response (see also Merriam *et al.* 2015).