NATURE PARKS AS INSTRUMENTS FOR SUSTAINABLE INTEGRATED REGIONAL DEVELOPMENT: REVIEW OF A SURVEY OF OPINIONS FROM STAKEHOLDERS IN LUXEMBOURG

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ABSTRACT

Today, protected areas have gained significant recognition in local development programmes, acting as instruments for sustainable integrated development. Whereas these goals have been achieved in some areas, in others, the idea remains contested and challenging. This paper focuses on strategies for integrating environmental conservation, economic prosperity, local wellbeing and resource governance, to probe the extent to which these are contributing to the appreciation of Nature Parks as instruments for sustainable development in Luxembourg. Two case studies indicate that adopting a multifunctional character, away from the traditional policy of pure conservation, is having important implications for rural development. Strategies for environmental education, innovative production and collaborative governance are setting a new standard of management and bringing forth new identities in rural areas. However, concrete social policies are lacking and local participation in Nature Parks' activities is insufficient. These limitations have most often been translated into questions such as, conservation for whom? It is, therefore, suggested that management strategies in Nature Parks be monitored routinely, using appropriate sustainability indicators, in order to ensure anticipated outcomes.

Keywords: Nature Parks, Luxembourg, Strategies, Instruments, Integrated development, Sustainability indicators.

INTRODUCTION

Protected areas span the globe, yet as their numbers increase so do concerns about whether these areas are able to maintain values and objectives (Frys -& Nienaber, 2011 Jungmeier et al, 2006; Mose, 2007; Nolte et al, 2010). IUCN defines protected areas as 'clearly defined geographical spaces, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley, 2008). Most of these areas are linked by the aim to conserve biodiversity and the ecosystem services they provide to help improve the lives of those living in or around the areas being protected. In Europe, Nature Parks are a form of protected area, covering about 25 per cent of land area in individual countries. Their objectives range from conserving nature, to connecting people with nature, improving sustainable tourism, to strengthening the knowledge capacity of rural areas. In Luxembourg, Nature Parks are the main type of protected spaces found in rural areas. The rural areas, however, are generally 'rurban' in nature, with increasing infrastructure development projects for housing and mobility. Nature Parks are, therefore, important tools to ensure that human activities do not impact natural resources in rural areas.

Defined by the law of 10 August 1993 as tools for integrated development in rural areas covering 5,000 hectares or more, Nature Parks in Luxembourg have double objectives: to enhance conservation and to promote socio-economic and cultural values within the framework of sustainable development. These objectives closely align with the management objectives of IUCN's category V protected area; that is 'protected areas that promote the interaction of people and nature over time, to produce an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values' (Dudley, 2008). Accordingly, such areas seek to

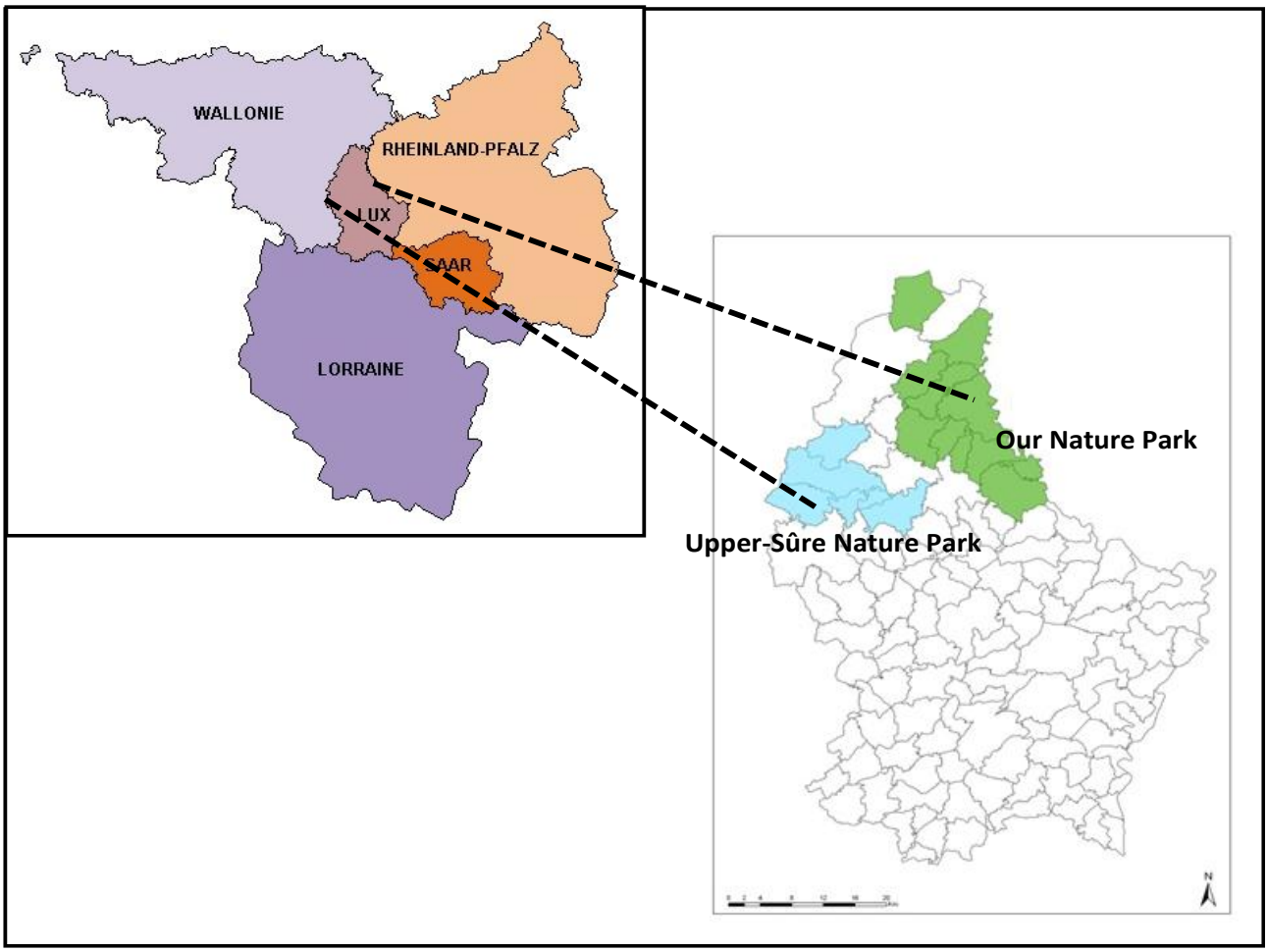

Figure 1: Location of Nature Parks in Luxembourg (Adapted from MDDI, Luxembourg)

restore historical management systems or maintain important landscape values while accommodating contemporary development and change. Nature Parks in Luxembourg balance traditional policies of conservation, which typically have authoritarian control at the centre, with present-day approaches that nurture a combination of preservation with other development functions (social, economic and governance). As such, there has been a growing expectation that Nature Parks contribute to or direct activities of regional development (Hammer, 2007b). Further, there is the need to regulate activities in Nature Parks in accordance with the varying objectives of sustainable development (Dudley, 2008). Consequently, areas of this kind are supposed to act as models of sustainability, so that lessons can be learnt for wider application (IUCN, 2012). Luxembourg's Nature Parks thus aim to mitigate resource depletion, while improving socio-economic prosperity and participatory regional processes, explicitly linked to development strategies.

Since the 1950s, Nature Parks in Europe have increasingly been managed to integrate conservation with development (Gamper et al., 2007). This has, amongst other things, improved knowledge on the importance of ecosystem services found in protected areas. It has also led to high expectations, especially on the part of local communities, on the integrated benefits that parks would bring to rural areas. However, Mose (2007) argues that although integrated development is being widely used in many conservation projects in Europe, experience with the concept varies. In some countries, while new approaches to achieve sustainable development in protected areas have been the subject of continuous discussion and empirical testing, little change can be identified elsewhere (Mose, 2007).

These concerns are the reason for this study. Given that limited knowledge exists, the aim was to understand whether parks in Luxembourg are moving along the path of sustainable integrated development, as set out by the law guiding their creation. A lack of empirical evidence has made it difficult to reconcile Nature Parks with rural development. As such, the objectives of this study were to analyse the strategies for promoting sustainable integrated regional development in Nature Parks, the consequences of these for rural areas and the factors limiting the advancement of such regional initiatives. The outcomes are informing policy makers on how to modify and enhance the performance of Nature Parks, to make these areas 'real living landscapes' (Hammer, 2007a).

A view of the Esch-sur-Sûre River © Franklin Feyeh Bahfon

METHODOLOGY

- **Study Areas**

The study was conducted in two Nature Parks: Upper-Sûre and Our (Figure 1). These are picturesque landscapes offering a rich biodiversity with water sources sloping down the Ardennes region. Their gentle slanting interlocking spurs harbour forests and fauna while the plateaus are mainly used for agricultural purposes.

The aim of the study was to answer the question: to what extent are management strategies contributing to the appreciation of Nature Parks by local, regional and national stakeholders, as instruments for attaining sustainable integrated regional development in Luxembourg?

The Upper-Sûre Nature Park was created in 1998 and is located in the north-west of Luxembourg, near the Belgian border. It has an area of about 183.87 km² of which 50 per cent is forested and 42 per cent is agricultural land. Altogether, the area has a population of about 6,000 inhabitants (Upper-Sûre Nature Park, 2014), grouped into four municipalities. The park includes Luxembourg's only artificial lake that acts as a reservoir for supplying about one-quarter of the household drinking water in Luxembourg. This park is devoted to preserving rare and endangered species of plants and animals. Management is mainly carried out by a biological station located in the park, which functions as a regional contact point for planning, implementing and monitoring schemes for biodiversity protection.

The park's governance brings together environmentalists, planners, local farmers, members of the tourism board and certain state ministries as well as the local population, to establish a strong participatory approach for regional development. Of importance, from the park's designation was the notion that those living and working in this part of the country are the ones responsible for bringing development to the region. A Nature Park is, therefore, a platform to assimilate essential concepts related to bottom-up development and is also a means to improve regional values. As such, the priorities of the Upper-Sûre Nature Park, in addition to those concerning biodiversity, are: to maintain the quality of drinking water from the Upper-Sûre River; boost value creation through the use of natural and cultural resources as well as improving the economic and social status of the region. Sustainable local production of food and non-food items is the main economic activity promoted in the park and it is intended to improve traditional production systems through eco-friendly production and marketing methods. The park also aims to attract small and medium-size enterprises to diversify traditional agricultural processes, which have been characterized by monocultures. The processed food and non-food products are derived from natural products (Field, 2008), and include products such as tea, cosmetics and household detergents.

The Our Nature Park was initiated by a local association (SIVOUR – Inter-communal Syndicate for the Our Valley) in 2005, as a means to represent the best interests of the region and beyond. The park covers about 306 km² with around 21,000 inhabitants and eight municipalities. It is an area rich in culture, with the castles of Vianden and Clervaux being some of the oldest preserved cultural artefacts in Europe.

Stakeholders of the park are working together to reconcile nature conservation and economic development of the region (Our Nature Park, 2014). As in Upper-Sûre park, the biological station in the Our park also coordinates regional projects for landscape and biodiversity protection. The park is renowned for conserving endangered species like the little owl (*Athene noctua*), various bats (*Antrozous*) and the European otter (*Lutra lutra*). It is also an important platform for promoting the cultivation and maintenance of deciduous and stem-fruit trees.

It is anticipated that the park will provide additional economic incentives, to improve the quality of life of the rural population whilst ensuring effective conservation. The production of foodstuffs and a few non-food items is at the centre of the park's economic activities.

- **Data Collection**

The qualitative technique of triangulation was used for data collection. Consequently, three main methods were used: fieldwork, literature review and semi-structured interviews.

Fieldwork helped in improving knowledge about ongoing projects, relevant reports, policy documents and literature related to the case study areas. It also helped to map out relevant institutions and stakeholders involved in regional strategies. The investigation was focused on local production units (farms, firms and marketplaces), with the aim of understanding the views of stakeholders about Nature Parks as regional tools for development.

Literature drawn from various sources was instrumental in linking the research results with the role of Nature Parks in influencing sustainable development. In this study, two distinct types of reviews were necessary; a review of peer reviewed literature and grey literature. The scope of peer reviewed literature was limited within the domain of environmental economic geography, to understand the interface between nature and economy in protected areas. Grey literature about Nature Parks was taken from policy and project files from public and Nature Park authorities, flyers, maps, seminars and conference papers, reports and other useful internet sites related to the Parks.

A total of nineteen semi-structured interviews were conducted from November 2012 to May 2013. Eight were with participants affected by the strategies of Nature Parks (i.e. owners of small businesses, agriculturalists, local producers and suppliers, and private individuals). Eleven were with stakeholders from government agencies (i.e. experts in the field of regional planning, environment, rural development and agriculture, including European projects on local development), local and Nature Park administration, researchers and NGOs. Criteria for selecting participants were guided by the reasoning that the study depends greatly on views and experiences. This was mainly directed by the research questions, which intended to understand the views of different actors about Nature Parks. As such, participants were either living in one of the Nature Parks or were experts with practical and/or theoretical in-depth knowledge about the patterns and processes of Nature Parks in Luxembourg. Ordinary citizens living in park areas were also important in relating Nature Parks with the local population. The MAXQDA 11.1 software for qualitative data analysis was used to organize and interpret the acquired data.

The interview process was guided by, but not exclusively limited to five groups of questions:

Environmental Domain

- What are the strategies for biodiversity protection in Nature Parks in Luxembourg?

Economic Domain

- How are Nature Parks through innovation and diversification, influencing local economic development, specifically in the production of food and non-food items?
- How can the processes for local production be described?

Social Domain

- How can the social dimension of the parks' policies be defined?
- What is the impact of Nature Parks' development on local employment?

Governance Domain

- What institutional relationship exists in Nature Parks?
- How would one describe the participatory process for Nature Parks' development?

Others

- What are the problems limiting efforts to encourage sustainable strategies in Nature Parks and how could these be improved?

Table 1. Summary of Nature Park strategies

Regional development strategies	Main characteristics
Environmental Protection	Environmental education
	Training on green skills
	Soil and water management
	Biodiversity management
	Environmental advice on local agricultural practices
	Eco-friendly agricultural methods
Economic Development	Small and medium size cooperatives (Eco-entrepreneurs)
	Sustainable production
	Regional marketing
Social Development	No social strategy for local employment
Participatory Governance	Inter-municipal cooperation

It is important to note that the ecotourism sector was not included in the analysis as sustainable tourism and regional development has been extensively researched (Cochrane, 2006; Driml & Common, 1995; EUROPARC Federation, 1993; Honey, 1999; Tapper & Cochrane, 2005). The economic analysis, therefore, concentrated on regional production of food and non-food items.

RESULTS AND DISCUSSION

The research highlighted the difficulty of describing how Nature Parks in Luxembourg have been influencing local development. This is because there are no organized data sources to indicate trends and monitor changes concerning activities in and around parks. However, from the interviews conducted, it is obvious that the two Nature Parks are having some effects beyond environmental protection, including aspects of economic development, participatory local governance and social wellbeing. A summary of the strategies is presented in Table 1 and discussed below.

- **Environmental Protection**

The strategies to prevent environmental degradation in Luxembourg's Nature Parks are linked to the ecosystem approach (Shepherd, 2008). The rationale is to strike a balance between policies of ecological preservation and economic development, to better involve and improve the quality of life of the rural population. This approach seeks to reconcile different actors' groups such as farmers, tourists, foresters and local producers, not excluding ordinary individuals, to a common agenda: sustainable use of available resources. Through schemes, such as education on sustainable development, viewpoints are shifting towards natural resource valuation and the promotion of skills required for sustainable production. Environmental education offers students of all ages a context for developing active citizenship and participation, embracing the complexity of the interdependencies of ecological, societal, and economic systems (Swayze, 2010). Main themes for environmental education revolve around water management. In both parks, authorities are using games, excursions and experimental exercises, to provide instruction on how to make surface and groundwater cleaner. Most learning activities are framed within subjects relating to environmental economic relationships so as to promote responsible economic activities along important water sources in Nature Parks.

Protecting water sources from harmful agricultural inputs and animal wastes is an important thematic area in the process of biodiversity management in both parks. Brochures to improve awareness on water conservation and use of pesticides are distributed during outdoor events or sent directly to residents. Also, actions are being taken, for example, to delay grass cutting around open fields. This is known as 'Fauchage tardif', a process for improving biodiversity, given that delaying grass cutting will provide valuable habitat for endangered butterflies. Each year, the parks in collaboration with the Ministry for Sustainable Development promote a tree planting campaign in areas experiencing reduction due to construction or ageing. Trees are provided for free to interested local inhabitants and this is meant to maintain the tradition in which villages are surrounded by orchards. In addition, certain rare species of plants and animals are monitored regularly by the biological stations, to maintain or improve growth. Examples include the non-venomous smooth snake (*Coronella austriaca*) and pyramidal bugle (*Ajuga pyramidilis*).

Contracts promoting biodiversity conservation ensure environmental stewardship with the aim of reducing harmful agricultural practices. Contracts, in the form of incentives, are signed with local landowners for the protection of certain plant and animal species, as well as

soil, air and water. A number of farmers are given financial compensation for their efforts in managing the environment and for restraining from intensive production practices, especially along water courses. Others are provided with technical and professional support. In the Upper-Sûre Nature Park, for example, the river contract (Contrat de Rivière Haute-sûre) is the main form of biodiversity contract, signed between park authorities and local farmers. This initiative started in 2006 under a European Community Interreg III project for the preservation of the Upper Sûre catchment area. By 2008, around fifty farmers in the Upper Sûre Nature Park had signed the river contract (there is no data to determine what per cent of total farmers this represents). They collaborated with park authorities to construct fences, drinking troughs and small bridges along and over brooks in farm plots, to prevent cattle from trampling along or having direct access to these water sources.

Well-trained specialists are also employed on a full time basis in the two Nature Parks to give technical advice to farmers. They advise farmers on the types of farming practices that are compatible with the local ecosystems and also, on the importance of organic farming in Nature Parks. Through this approach, innovative methods of soil protection, such as direct drilling (ploughing topsoil to a depth of 5 cm in order to retain the humus layer) are being promoted. This has proved favourable in maintaining soil stability and increasing yields. Before the introduction of this technique, local farmers were usually engaged in a traditional ploughing system, rotating the entire topsoil at a depth of about 30 cm. This led to nutrient leaching and soil erosion, estimated at thousands of tonnes of topsoil per year, including related impacts such as lower crop yields and profits.

- **Economic Development**

The authorities in the Nature Parks are trying to encourage an economic approach that improves innovation and diversification in the production of local goods, bringing forth new strategies that blend traditional with modern agricultural practices. These have generated a strong identity for the rural areas concerned. Before the creation of Nature Parks, mono-production of basic raw materials with no further processing, mainly as animal feed was the main activity. The creation of Nature Parks has led to production activities being developed by local cooperatives. Accordingly: '*Today, more than 80 per cent of locally obtained raw materials are not exported as before but are being processed using guideline principles made available by park authorities*' (Remark from a local farmer).

This has led to the production of quality tea, beef and cereal products such as flour and pasta, as well as candies, a perfume, beer, soap, and body creams. These commodities are obtained from plants that are locally grown and they are contributing greatly in boosting the identity of park areas through the *VumSei* and *BEO* brands. Consequently, a local identity has now been established through park labels and this has been considered a great added value in marketing regional products. Today, these food and non-food items with eco -labels can be found in shops in and around the Nature Parks. *'Although there are generally no official statistics, we have been seeing an increase in sales of between 10-15 % yearly'* (a local producer).

For over twenty years, the two Nature Parks have been playing a significant role in promoting a new form of agriculture which aims to be compatible with the immediate surroundings and provides new opportunities to local producers. This 'third way of rural development' (Loloudis 1999, in Nastis & Papanagiotou, 2009) is an approach to economic diversification that focuses mainly on agriculture and agricultural enterprises in rural areas (Nemes, 2005). The first ever herbal tea production unit in Luxembourg, for example, is an initiative of local farmers in the Upper-Sûre Nature Park. Promoting tea production is an innovative process to stimulate eco-friendly activities in economically sensitive domains. That is, parks are encouraging economic actions that have little or no influence on nearby ecosystems. It is encouraging to see how an economic activity like this includes measures to both protect water sources and produce quality products. Tea products are mainly made from medicinal plants and other herbs, grown and processed in the Nature Park. The plants are cultivated without the use of fertilizers and pesticides in order to comply with strict regulations regarding nature conservation and environmental protection.

The production of mustard is another example of innovation and diversification. Farmers in Our Nature Park have been educated on how to process mustard seeds to produce six different mustard products. Before this initiative, much of the mustard consumed in Luxembourg was from Canada. Thus, this is also an example of how this park has been attempting to reduce trade flows between continents, for products which can be manufactured locally.

- **Social Development**

Social development is a major challenge in Nature Parks, with respect to employment. For a long time employment opportunities have been focused on the southern part of

Esch-sur-Sûre Village © Franklin Feyeh Bahfon

Luxembourg City, but with the regional initiatives associated with the Nature Parks, it is anticipated that parks will help to reverse this situation. However, to date the objectives for improving social wellbeing have been broadly defined and lacking implementation. The problem is that: '*In the legislation enacting the creation of Nature Parks in Luxembourg, specifications as to how parks would increase wellbeing or add value to the lives of those living in these areas are lacking*' (government administrator). Also, **'***Most social objectives are only on paper and some of us on the ground know little about whether the objectives are attained or not'* (local inhabitant).

Youth employment programmes are lacking, although they could play a great role in this aspect of development. Consequently, doubts about social impact are often manifested. Such imbalance in social development should be corrected if Nature Parks are to be involved in regional development (UNRISD, 2012). This is because social policies can perform multiple functions in any economy, including those of protection and can help to test whether Nature Parks are making positive or negative contributions to the livelihoods of people living immediately adjacent or further away.

Many stakeholders have been expecting that Nature Parks, through various development oriented policies, would be able to improve local welfare especially in terms of job creation. Although some local cooperatives have been trying to boost local employment, it is argued that this is insignificant because labourers are mainly from within a single family. Therefore, it can be argued that: *'Nature Parks have done relatively little in the domain of local employment. In this sense, it can be concluded that social development is not as important as economic and environmental development…Similarly, Nature Park authorities most often forget about the local population who have otherwise contributed more to the image of Nature Parks than what they gain socially from parks, even though this is hard to prove' (local inhabitant).*

This is certainly not a positive image for Nature Parks as the idea of combining environmental preservation with priorities of economic development has led to high expectations about the contributions parks will bring to the region (Mose, 2007). In future, if social and economic objectives are to be compatible with biodiversity conservation, attempts should be made to integrate these within planning and management (Rodríguez-Rodríguez, 2012).

- **Participatory Governance**

Generally, decisions regarding management of parks in Luxembourg are taken at three main levels. At the national level, the Ministries for Sustainable Development and Infrastructure, Agriculture, Rural Development and Forestry, are active in managing the activities of Nature Parks. These institutions are responsible for coordinating all spatially relevant policies within the Nature Parks and between parks and other administrative levels. They also evaluate the ecological potential of Nature Parks and define proposals for protection, restoration and management.

A local shop for Nature Parks' products, with insert tea products from Vum sei cooperative © Franklin Feyeh Bahfon

The municipalities in the areas of the two Nature Parks are represented together in a regional organization that runs the development processes in the parks. Management is divided into various sections (executive, park administration, mixed working groups and regional syndicates), each of which has a specific duty to ensure the smooth functioning of the parks. In general, these segments ensure that proper decisions are made with respect to the coordination of regional projects. This inter-municipal cooperation for sustainable development is one of the most important achievements of the Nature Parks and a significant contribution towards encouraging a win-win situation in resource management where both top-down and bottom-up objectives are simultaneously dealt with. The two parks thus each make up a sort of invisible region, in a country where decisions about spatial planning and development are managed only at the local and national level. Therefore, Nature Parks could be confirmed as regional instruments for resource governance. For example: '*The occasion to meet with actors from other municipalities and institutions to discuss aspects related to Nature Parks and regional development would not have been possible if there were no Nature Parks*' (local administrator).

Local level governance is composed of local business owners, and farmers' and producers' cooperatives, including tourism organizations. These are the main stakeholders influencing the production economy in the park areas. They have the greatest decision making on what and how to produce food and non-food stuffs.

Integrated decision-making processes are common in projects that are related to local production and water management. Synergies can be found among sectors and across scales. Even though there is evidence of conflict of interest especially between local producers and the administration of the different parks, a common language (Qalyoubi, 2012) to decide quality labels, to agree on certain farming and biodiversity management techniques, as well as the marketing of regional products has developed between the two Nature Parks. In this respect, the parks' strategies have gone a long way to promote collaborative governance in which stakeholders co-produce goals and strategies and share responsibilities (Althea & Rehema, 2012) on approaches, rules, practices and institutions that shape how humans interact with the environment (UNEP, 2010).

The governance system practised in Luxembourg's parks seeks to ensure that all actors are involved to better manage and develop local potentials and to promote cooperation on topics related to protected area development. However, local participation, which is supposed to be an important contribution to this process, is insufficient. In some cases, diverging ideas about the operational qualities of park development have led to governance structures falling apart. In Our Nature Park, for example, communication between some local producers and park authorities has ceased for about six years now. *'At the moment we (farmers' group) do not have any cooperation with them (park authorities) even though there was a sort of understanding in the*

beginning when the LEADER project started' (local producer).

Disagreements between actors are normally due to misconceptions on aspects related to development and protection; the power to control and how to finance projects; divisions over what aspect of economic activity needs to be encouraged or commercialized and the transparency approach for controlling quality products.

Furthermore, some local inhabitants defend their continuing failure to participate in parks activities with the opinion that projects in park areas are not destined to help those living around these areas. *'Even though there is a lack of a culture for public participation in the Our Nature Park, for example, people in this area cannot identify themselves with projects which they are not part of... One reason for the lack of engagement is because parks' projects are too vague, which at the end yield less fruit than expected, making it difficult for the local population to recognize any concrete achievements. Another reason might be that local projects are directed more towards visitors (tourists) rather than to the local population' (local inhabitant).*

Judging from this, a new realism is necessary for policy and practice to navigate conflicts and to make difficult choices. This will help to ensure that Nature Parks' governance indeed integrates the concerns of all stakeholders.

CHALLENGES AFFECTING NATURE PARKS' STRATEGIES

- **Inadequate mechanisms to encourage organic production**

Notwithstanding the efforts made by Nature Parks' authorities to promote sustainable agriculture, there are still some gaps, especially regarding organic agriculture. Many farmers still practise conventional agriculture, which can have deleterious impacts on biodiversity. Although there are ongoing efforts by the Institute for Biological Agricultural Research (IBLA) to convert conventional farmers to organic producers, under the project; 'Organic Farmers in Nature Parks', most conventional producers are sceptical about the importance of such a transformation, thinking it will reduce profit. This is a barrier limiting conversion to organic agriculture in many countries (Smit et al., 2009). Reports from UNEP (2011) contradict this notion, insisting that profits from organic agriculture are good. This is because organic products can command higher prices, often a premium of about 20 per cent when compared to conventional agriculture (UNEP, 2011). In this sense, farmers' incomes can remain generally high and the adoption of organic techniques can give a new life to rural communities. It is important to note that Luxembourg has the third highest per capita consumption of organic products in Europe (Helga & Lukas, 2012), but very few farmers are engaged in such a practice, let alone in Nature Parks. As such: *'If there is any place within Luxembourg where organic farming is to be encouraged, it should be in Nature Parks. This is because parks have the maximum potential to do so'* (agricultural specialist).

Much of what is currently being produced in the park areas (tea, cereals, edible oil, mustard and cosmetic products) are categorized as quality items. It is, therefore, difficult to distinguish Nature Parks from other areas, based on local production only. It has been argued that as Nature Parks are protected areas, production should only be carried out using organic means. However, because the success of agriculture in many European Union countries depends more on subsidies than on the quality of their products, there is a tendency to favour quantity and not quality. Faced with this situation: *'The question should be; is it better to use public money for quality products or is it for the local producers to decide?'*(organic producer).

- **Lack of transparency in local production**

Moreover, there are certain hidden practices that limit transparency in the entire production chain of goods from parks in Luxembourg. Some products made with raw materials obtained from areas outside the parks are being labelled as from Nature Parks. Bringing these raw materials into the parks entails negative externalities, for example, from long distance hauling. The situation is becoming serious in Our Nature Park where there are no generally agreed principles for local production. To attain a level of sustainability in regional production, production standards should not only be limited to quality criteria published by park authorities, they should also take into consideration the entire production lifecycle. This is particularly important in building consumer trust.

- **Inadequate knowledge about the concept of the Nature Park**

Another major obstacle is the lack of understanding about parks as tools for sustainable development. This is a result of insufficient knowledge and different stakeholders have different views about how parks can effectively contribute to regional development. Some think of parks as areas for conservation only, while others reflect on either the economic or social facet of

A brook joining the Esch-sur-Sûre River © Franklin Feyeh Bahfon

parks' development. Consequently, there are disagreements on which path to follow in order to promote sustainable outcomes. It is understood that this difficulty is a result of differences in goals and expectations among stakeholders involved in the development of parks in Luxembourg. Most public actors want to encourage ecological principles, thinking this is the most important aspect of protected area management. On the other hand, some local stakeholders would prefer aspects related to economic and social development, given that these would have direct or tangible consequences on local citizens. As such, the issue is about finding the right balance which should be guided by intensive awareness building on the conceptual and practical meaning of a Nature Park.

- **Disagreement over the size of existing parks**

There is confusion or uncertainty among stakeholders on whether existing parks are large enough to operate as separate entities for regional development. Some municipalities are interested in merging the two parks so as to have a wider region with greater comparative advantage and improved political powers over decisions on nature conservation. Others argue that this will slowly, but surely, erode the power of individual municipalities over decisions related to regional planning and development. Consequently, this has escalated tensions. There is now conflict over concepts of local development and one municipality (Rambrouch) situated in the middle of the Upper-Sûre Nature Park withdrew its participation in all park activities.

RECOMMENDATIONS

This study was concerned with the practical understanding of Nature Parks as instruments for sustainable integrated regional development. It was observed that in Luxembourg, as in other European countries, strategies for integrated development highlight the notion of a paradigm shift in protected area management (Mose, 2007), where designated functions have moved far beyond biodiversity conservation to include other aspects, mainly economic, social and governance processes. Furthermore, the case of Luxembourg reflects the limitations which according to Nolte et al. (2010) and Dudley (2008) are often discussed in relation to protected area management effectiveness in Europe. The difficulties in implementing the objectives of social wellbeing and ensuring proper participatory processes in parks in Luxembourg are clearly impacting management effectiveness. Consequently, the following recommendations might help to design more practical strategies. They have relevance throughout Europe, where many protected landscapes (i.e. areas managed as category V protected areas) face the same challenges.

Table 2. Sustainability indicators to improve Nature Parks' performance

Domain	Main Indicators
Ecology	Number of farmers involved in organic farming within park areas
	Number of farms converting to organic agriculture
	Number of contact points for issues of environmental protection
	Monthly measurement of nitrate quantity in water sources
	Number of social learning activities related to biodiversity protection
Economic	Quantity of agricultural pesticides used per year in park areas
	The number of local producers engaged in organic production
	Agricultural area under organic farming
	The proportion of products with park labels in relation to total goods produced in park areas
Social	Yearly survey of local levels of satisfaction regarding Nature Park outcomes
	Number of new jobs directly linked to activities in Nature Parks
Governance	Number of meetings between stakeholders to improve regional network per year
	Number of partnerships per year within and beyond park areas to combine local and national strategies for regional development
	Number of regional/local actions per year to motivate local interest in participating in park activities

If parks in Luxembourg want to improve performance on economic development, an important consideration would be to design more practical strategies that would improve sustainable agriculture, particularly organic production. Sustainable agriculture is a philosophy based on human goals and on understanding the long-term impacts of our activities on the environment and other species (Robinson, 2008). The use of this approach guides the application of prior experience and latest scientific advances to create integrated, resource-conserving and equitable farming systems. This will help to distinguish park areas from other rural areas where initiatives are also taken to promote sustainable production, as well as providing biodiversity outcomes.

There is also a need to consider the merging of the Nature Parks, to improve regional economic performance. This does not reflect a physical extension beyond present boundaries. Rather, it represents a political process, to open new corridors for producers and consumers, including knowledge sharing and power over decisions creating a regional competitive advantage. It might also lead to the establishment of a specific label for both Nature Parks.

It is important to increase efforts towards motivating the local population to be pioneers of almost all initiatives organized in the park areas. This will go a long way to help local people identify themselves with park activities and increase local responsibilities on issues of regional governance and development. Stakeholder dialogue should be considered a priority, while awareness building or knowledge sharing on the value of local potentials should be a recurrent theme in the project cycle management of park areas.

Strategies in Nature Parks should be monitored routinely, using appropriate sustainability indicators (see Table 2), in order to ensure anticipated outcomes within positive levels. Through this, less successful strategies could be redesigned to improve results and address certain challenges, especially those related to social development.

Finally, it is necessary for stakeholders to understand the vagueness and challenges of the concept of sustainable development. This will help eliminate poorly defined objectives and improve knowledge among the local population that a Nature Park is just an instrument among others, not a panacea for all regional problems.

ACKNOWLEDGEMENTS

I would like to thank the authorities of the two Nature Parks, including all those who participated in the interview process. Also thanking Prof Dr Christian Schulz and Dr Ariane König for overseeing the study.

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RESUMEN

Hoy en día, las áreas protegidas han cobrado un importante reconocimiento en los programas de desarrollo local, sirviendo como instrumentos para el desarrollo integral sostenible. Si bien en algunas áreas se han logrado estos objetivos, en otras, la idea sigue siendo polémica y desafiante. Este estudio se centra en las estrategias para la integración de la conservación ambiental, la prosperidad económica, el bienestar local y la gobernanza de los recursos, para investigar la medida en que estos elementos contribuyen a la apreciación de los parques naturales como instrumentos para el desarrollo sostenible en Luxemburgo. Dos estudios de caso indican que la adopción de un carácter multifuncional, apartado de la política tradicional de conservación pura, está teniendo consecuencias importantes para el desarrollo rural. Las estrategias para la educación ambiental, la producción innovadora y la gobernanza basada en la colaboración están dando lugar a una nueva norma de gestión y generando nuevas identidades en las zonas rurales. Sin embargo, se carece de políticas sociales concretas y la participación local en las actividades de los parques naturales es insuficiente. Estas limitaciones se han traducido con frecuencia en preguntas tales como, ¿conservación para quién? Por lo tanto, se sugiere un seguimiento rutinario de las estrategias de gestión de los parques naturales, mediante indicadores de sostenibilidad adecuados, con el fin de garantizar los resultados esperados.

RÉSUMÉ

Les aires protégées ont désormais acquis une importance bien reconnue dans les programmes de développement local, car elles agissent comme des instruments de développement durable et intégré. Alors que certaines régions atteignent cet objectif, pour d'autres l'idée reste contestée et complexe. Ce document traite des façons d'intégrer la conservation de l'environnement, la prospérité économique, le bien-être local et la gouvernance des ressources, afin d'examiner de quelle manière ceux-ci influencent la perception des parcs naturels en tant qu'instruments de développement durable au Luxembourg. Deux études de cas indiquent que le fait d'adopter un système multifonctionnel, loin de la politique traditionnelle de conservation pure, a des implications importantes pour le développement rural. Des stratégies visant l'éducation environnementale, l'innovation et la gouvernance collaborative créent de nouvelles normes et de nouvelles façons d'appréhender la gestion les zones rurales. Cependant, les politiques sociales concrètes font défaut et la participation locale dans les activités des parcs naturels est insuffisante. Ces limitations sont le plus souvent exprimées par des questions telles : la conservation pour qui? Il est donc proposé une surveillance systématique des stratégies de gestion des parcs naturels, utilisant des indicateurs de durabilité appropriés, afin d'assurer les résultats attendus.