Analysis of the relation between land rights and environmental measures in protected areas in Tanzania: the case of Saadani National Park

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March, 2010

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By

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Thesis submitted to the International Institute for Geo-information Science and Earth Observation in partial fulfilment of the requirements for the degree of Master of Science in Geo-information Science and Earth Observation, Specialisation: Land Administration.

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Abstract

The establishment of protected areas is a worldwide practice that intends to defend biodiversity and wildlife from human development. Such a policy tends to neglect rights of local communities, mainly in the practice of national parks. This is a restrictive measure that imposes difficult and most of the time conflicting effects to the people settled around. Considering that Tanzania is a country that has widely embraced this approach, the aim of this study was to analyse the effect relation between the establishment of Saadani National Park, the most recent gazetted national park, and the diverse rights in the neighbouring area hold by local communities. For this aim, data was gathered in the villages of Saadani, Uvinje and Bujuni as well as diverse secondary sources. As a way of a general understanding of the facts, the conceptual framework DPSIR was adapted to the context of this research and used to categorise and identify the most relevant elements that are related and somehow influencing the system establishment of SANAPA-people living inside or near outside the park. Also conceiving modelling and analysis of perceptions as a good means to detect differences in views of different stakeholders related to an issue, thus supporting the recognition of existing conflict between them, in this research DANA software was used as a computer-based tool for performing such analysis. Results of DPSIR framework allowed getting an overview of the 'system' such as the influences of certain policies, the character of the economy of the area: mostly based on agriculture, livestock keeping and finishing; the presence of a growing population that surrounds the park together with an increased limitations in livelihoods and boundaries uncertainty, among others. Having these results it was possible to derive indicators that would help in understanding and detecting possible sources of conflicts. Complementing these results, DANA analysis revealed that the stakeholders only diverge in the actions that should be taken, not in the goals for the 'system'. From the analysis of inferred best and worst strategies in DANA, it was possible to identify a conflict in relation to illegal access to the park by local communities, which in the view of villagers should increase while for TANAPA it should reduce. Interestingly, the worst strategy for villagers was identified as 'keeping things as they are': unfair compensation, loss of rights to land and to land resources and community displacement. With this knowledge, it was possible to propose some instruments to be included in the implementation of SANAPA to reduce the existing conflicts observed. Outputs of the DPSIR framework with the modelling of perceptions with DANA were conceived as complementary in allowing the analysis going from general to more specific issues and allowing cross-check of the results for the sake of validity. It is important also to consider that due to the basis on causal relations that both methodologies have, gathering considerable data is needed to provide reliable outputs. Stakeholders ideally should be involved in the process of analysis validating the results. In general, this approach seems to be consistent and provides a potential applicability in diverse issues of land administration studies.

KEYWORDS: Conflicts, DANA, DPSIR, environmental measures, national parks, perceptions graphs, SANAPA, policy instruments.

Acknowledgements

"Praise the LORD, all you nations; extol him, all you peoples. For great is his love toward us, and the faithfulness of the LORD endures forever. Praise the LORD" *Psalm 117*

My heart is completely grateful to the Lord for giving me the opportunity to study at ITC and for having brought me with His blessings so far. Writing a thesis is not an easy task; that would have not been completed without the contributions of several people. Firstly I would like to extend my deep gratitude to my first supervisor and course director Ir. Kees Bronsveld and to my second supervisor Prof. Jaap Zevenbergen for all their help and valuable comments and suggestions to this document. I thank all lecturers in ITC, particularly in Land Administration course and all administrative staff for their contribution to the accomplishment of my studies. I am really grateful to NFP for granting me the scholarship to follow my MSc in the Netherlands.

I would also like to extend my sincere thanks to Ardhi University staff in Tanzania in the names of Dr. H. Kayuza, Mr. F. Komu, Ms. K. Moyo, Eritruda and all those that contributed to my work and assisted me during my stay in Tanzania and very especial thanks are to Dr. A. Mwasumbi for her valuable collaboration. Mi gratitude goes also to Prisca for her assistance in the translations during the fieldwork. My sincere appreciation for their time spent answering my questions or helping me to get the information I needed is given to staff from Dar es Salaam University particularly Institute of Resources Assessment, Ministry of Natural resources and Tourism, Wildlife Division and Bagamoyo District Council as well as villagers from Saadani, Uvinje and Buyuni in Tanzania.

Thanks to LA family 2008-2010 for the fellowship during all the nice and tough time we went trough during these 18 months. I am grateful to all my friends in ITC and in a very special way to Serah and Firas for their love, kindness and support.

I thank also the apostles Fernando and Graciela Betancourt for their love and for their prayers for me: *Dios los bendiga abundantemente*. I would like also to express my gratitude to those friends and relatives that were always supporting and encourage me through the distance.

Last but never least my deep thankfulness goes to my mom: *Mamita gracias por la educación que me brindaste, gracias por apoyarme en todos mi planes, gracias por tus oraciones, gracias por ser la mama tan maravillosa que eres, Dios te bendiga siempre*; to my sister: *Lilian gracias por tu cariño, gracias por lo especial que eres conmigo y gracias por ser mi amiga;* and to Rodri: *meu amor lindo muito obrigado por todos os momentos compartilhados, obrigado por todo o seu apoio incondicional para mim*; *muito obrigado pela sua contribuição para a minha tese. Eu agradeço muito a Deus por sua vida e por ter o colocado em minha vida, eu amo você.*

Libia Yelena Romero Lara
Enschede, February 2010.

Dedicated to the memory of my beloved father Joaquin Romero,
My mom, my sister and Rodrigo.

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List of abbreviations and acronyms

ARU	Ardhi University
DANA	Dynamic Actor Network Analysis
DPSIR	Driving forces - Pressures – State – Impacts – Responses
EMA	Environmental Management Act
GTZ	German Agency for technical cooperation
IRA	Institute of Resource Assessment
IUCN	International Union for Conservation of Nature
MNRT	Minister of Natural Resources and Tourism of Tanzania
NBS	National Bureau of Statistics
NEAC	National Environmental Advisory Committee
NEP	National Environmental Policy
NLP	National Land Policy of Tanzania
NPP	National Parks Policy
NPoP	National Population Policy of Tanzania
SANAPA	Saadani National Park
SGR	Saadani Game Reserve
SCDP	Saadani Conservation and Development Program
TANAPA	Tanzania National Parks
WMA	Wildlife Management Areas

1. Introduction

Studied literature coincide about the benefits obtained through the establishment of protected areas e.g. National Parks. One of the main observed benefits, it is the defence of biodiversity and wildlife, which without a preventive action, would be irreparably damaged by human development. Nonetheless the practice of such a restrictive policy has had some difficult and most of the time conflicting effects. People settled around those areas are who usually 'pay the cost' for the environmental protection.

Attending the basic concept of a national park, its establishment supposed the displacement of local communities, rural and mostly poor people, and the curtailment of their traditional rights. Moreover, despite the fact that their livelihoods and their incomes were disturbed, they do not perceive any revenues from the commercial activities that take place in the park.

This first chapter includes a general description of the general aspects of the issue here analysed (Section 1.1), the problem context (Section 1.2) and the problem statement (Section 1.3). The following sections include the bases of this research: research objectives (see Section 1.4), research questions (Section 1.5), conceptual framework (Section 1.6), research methods (see Section 1.7), thesis scope (Section 1.8) and finally, thesis structure (Section 1.9).

1.1. Background

Soil, air, water, climatic factors and livings organisms (Agrawal 1994) all together are the basic elements of the Environment. Thus attempts to protect it requires an interdisciplinary approach to comprehend all the process that take place between these elements and the way man influences those processes (Jørgensen and Johnsen 1989).

In fact it is the way people interact with the Environment which determines the repercussions on natural resources but also on quality of people's life (Randolph 2004). Therefore to avert or lessen detrimental effects on the Environment and the different resources and also to ensure that those changes in the Environment introduced by human, do not have dangerous effects on humans life, governments adopt diverse environmental policies (Nijkamp 1980).

A wide range of measures may be used to implement and achieve environmental policy objectives (Janota and Broussard 2008). Achieving desired results requires the collaboration of private right-holders and other actors with interests vested in land. Such an approach is likely to ensure the identification of points of convergence and divergence between the originators of the policy and those who will be the focus of policy interventions (i.e. environmental measures). Whenever the points of agreement and disagreement between these two main actors, have not been certainly considered and identified, there is in most of the cases, a high level of frustration in the accomplishment of preferred policy outcomes (Cocklin, Mautner et al. 2007).

Nevertheless development of new measures is not always needed, rather to design them to best suit the circumstances in place (Sterner 2003), i.e. the array of existing rights over land. Moreover the level of impact that some environmental measures have over people's rights will determine the disposition of the people towards various measures, and consequently the success or failure of such measures (Balint 2006).

Failure takes place whenever the environmental policy does not meet its goals (Birkland 2005). In this context, a failure does not have to mean the lack of effective conservation, but when a policy does not take care of the existing rights to reduce the levels of pressure and conflict resulting from the non compensation of affected right-holders (Balint 2006).

1.2. Problem Context

Tanzania is a country that is highly dependent on its natural resources such as woodlands, forest and rivers. These resources play an important role in terms of social and economic good and services in the national economy (The United Republic of Tanzania 2007). The state of the Tanzania Environment is a matter of concern for the government and also policy makers are increasingly aware of environmental issues; the National Environmental Policy (NEP) identifies six major problems for urgent attention: "land degradation, lack of accessible and good quality water, environmental pollution, loss of wildlife habitats and biodiversity, deterioration of aquatic systems and deforestation" (The United Republic of Tanzania 1997).

The current existing problems of the Environment sheds light on the crucial need for enhancement of environmental policy preparation, making and implementation of environmental measures and outcomes (Homewood 2004). The implementation of environmental measures by the authorities in charge may face conflicts when interventions on private rights of local communities occur (Wanitzek and Sippel 1998). As is stated in (Sandberg 2007) the potential alternatives in policy making will always be limited by the social facts already in place.

Some disputes regarding land matters in or around protected areas in Tanzania, as a consequence of discrepancy of interests between local communities throughout the Tanzanian countryside and governmental institutions that manages and administrates those protected areas, have been reported (Wanitzek and Sippel 1998).

The need to deal with possible conflicts becomes evident when one considers the enormous space covered by protected areas in Tanzania: 39.6% of total land area is protected area (World Resource Institute 2007). This includes 14 national parks, 34 game reserves, 1 conservation area, 1 biosphere reserve, 3 world heritage sites and 43 game controlled areas (UNEP - SCBD 2009). The Environmental Management Act (EMA) of 2004 defines protected area as those that "are prone to soil erosion and those with fragile nature or high environmental significance". What's more, loss of wildlife habitats and biodiversity is an issue of concern in Tanzania, where this issue is identified as a current threat of the national heritage as well as a precursor of uncertainty about the future of the tourism industry. In fact, the NEP addresses the need to preserve and enhance the biological diversity of the ecosystems of the country.

1.3. Problem Statement

Environmental measures are likely to focus merely on environmental implications and underestimate the importance of critical variables such as rights (e.g. ownership rights, use rights, customary rights, water rights, etc.) Both the establishment of some quantifiable indicators that regard community and individual rights as well as the implementation of some instruments clearly designed to deal with those rights, it is a key issue to consider when addressing the variable rights (Balint 2006). The complexity of such a variable is higher in a country like Tanzania were the presence and strength of various types of formal and traditional rights is diverse (Wanitzek and Sippel 1998).

It is not generally known, also not by policy-makers, what the extent is to which existing rights and interest over land as well as the existing use determines the performance of the measure's implementation (Wanitzek and Sippel 1998). Thus it is necessary to understand this relationship between these issues and the way to deal with them.

1.4. Research Objectives

The main aim of this research is to understand the conflict relation between environmental measures and private rights and to propose possible mechanisms for dealing with it. This research has the following specific objectives:

1. To investigate the elements that influences the conflicts between the establishment of an environmental measure and the existing rights to land and to land resources in a protected area.

2. To identify the possible indicators for conflicts between the decision-making process in environmental measures and the land rights.

3. To understand the way in which stakeholders' perceptions influence the implementation of an environmental measure in a protected area.

4. To propose the possible instruments that should be included in the environmental measure design and implementation for the study area.

1.5. Research Questions

The questions that need to be answered to attain the main objective of the research are presented in Table 1-1.

Table 1-1: Research questions

Research Objectives	***Research Questions***
1	What are the elements that influence the effect-relation between an environmental measure and the existing rights to land and to land resources in a national park?
2	Which are the possible indicators of conflicts between the implementation of an environmental measure (e.g. establishment of a national park) and rights local people hold?

Research Objectives	*Research Questions*
3	How do stakeholders perceive the implementation of environmental measures like the establishment of a national park?
4	What are the best suitable instruments to be included in the implementation of environmental measures with an accepted level of effect by a right holder in a national park?

1.6. Conceptual Framework

Figure 1-1 depicts the conceptual framework of this research. The data is collected using case study research methodology with a single case of analysis, which in this context corresponds to Saadani National Park (SANAPA).

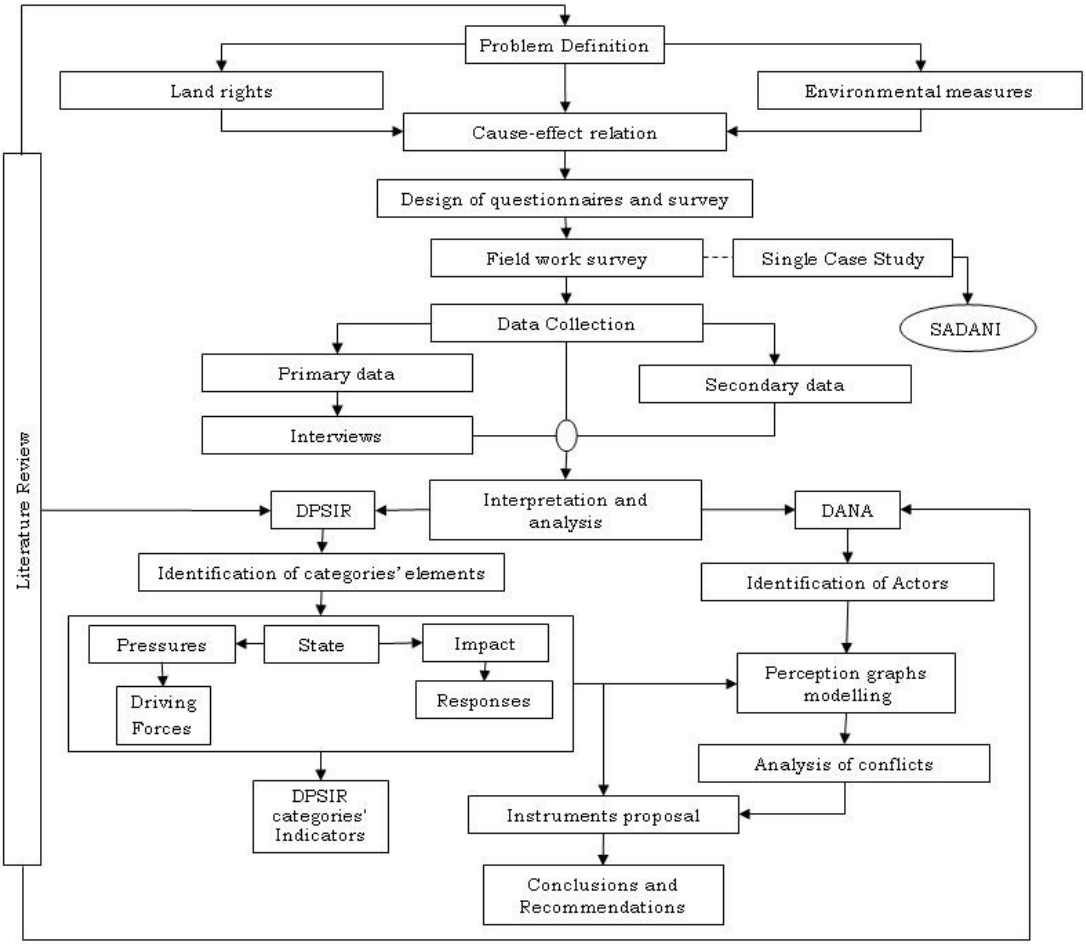


Figure 1-1: Research conceptual framework

1.7. Research methods

Based on the research questions previously listed, the research methodology has been designed as follows. Table 1-2 presents the methods to be used as well as the input and output for each research question.

1.7.1. Literature Review

Literature review were carried out regarding to: environmental regulation for protected areas, environmental measures adopted in areas with private land right-holders, indicators for environmental measures and the reported effects and conflicts of the establishment of protected areas at the national parks degree of protection. All this, to establish what have been studied and what have been said about the topic. The literature review provides a stepping stone for this research.

1.7.2. Case Study

A single case study in a protected area in Tanzania: SANAPA, was carried out, to obtain empirical data that allows investigating and recognising the conflicts resulting after the implementation of an environmental measure, e.g. a national park and the way it affects some private rights. The following steps were identified to achieve the main objective of this research. A) In the pre-field work period, a questionnaire was designed to collect data from key actors in the establishment of SANAPA and local right-holders affected by its establishment. B) Collection of data in the field using questionnaires.

1.7.3. DPSIR Conceptual Framework

The data collected plus the literature reviewed is interpreted using an adaptation of the DPSIR framework (Driving forces – Pressures – State – Impacts – Responses). This method assumes cause-effect relationships between interacting components of social, economic, and environmental systems (UNEP - GRID Arendal 2003).

1.7.4. Indicators Establishment

Following the identification of the elements assumed to be influential in the effect relation between the establishment of SANAPA and the rights of local communities, some indicators were drawn. Indicators are considered as possible ways to ensure sustainability as well as to measure the performance of any environmental policy, report and communicate about it (Ramos, Alves et al. 2007). The results of the DPSIR conceptual framework were used as an input to identify indicators to predict possible conflicts about the subject study in the context of this research.

1.7.5. Perception modelling – DANA

This method was applied to model the possible sources of conflicts between the establishment of SANAPA and its regulations as a national park and the existing rights of local villagers. The analysis was done using the software Dynamic Actor Network Analysis (DANA). The use of this tool supported the analysis of the actors in the establishment of a national park, through modelling of their perceptions about the issue (TU Delft 2004).

1.7.6. Instruments Proposal

When policy instruments are effective, they promise the achievement of the policy objectives and at the same time the involvement of the people in the subject of the policy. Having identified the conflicts concerning rights of local communities resulted due to the establishment of SANAPA, with DANA software, and the indicators of it with DPSIR framework; the final step of this research was the suggestion of the best suitable instruments that address the issue analysed in this research.

Table 1-2: Research methods

Research Question	***Method***	***Input***	***Output***
1	Literature review	Relevant literature found	Identification of possible elements that lead to conflict
	Case study	Interviews, secondary data, observations	Identification of current elements that lead to conflict
	DPSIR Analysis	Identification of the elements that leads to conflict under the DPSIR categories	DPSIR framework
2	Literature review	Relevant literature found	Identification of possible indicators to predict conflict
	Indicators definition	DPSIR framework	Indictors according to the DPSIR framework
	Indicator establishment	List of indictors according to the DPSIR framework	Indicators
3	Case Study	Interviews, secondary data, observations	Stakeholders' perceptions, goals, strategies.
	Cognitive mapping	Stakeholders' perceptions, goals, strategies.	DANA stakeholders' perceptions Analysis
4	Literature review	Relevant literature found	Identification of possible instruments
	Instruments Proposal	DANA stakeholders' perceptions Analysis + DPSIR instruments + Possible instruments	Suggested best suited instruments

1.8. Thesis Scope

Under these circumstances, questions aimed at finding the relation between environmental measures in Tanzania: specifically those intended to address wildlife conservation as the establishment of a national park and the diverse rights existing in this protected area were the central issues carried out in this research. The research also aspired to model the possible conflicts between these two elements: establishment of protected areas, more specifically the case of SANAPA and rights of local communities and to define indictors for these conflicts and to include the best suitable instruments.

1.9. Thesis Structure

Chapter 1: Introduction

This is the opening chapter of this document which supplies an overview of the research context and the drivers and motivation to investigate about the conflict-relation between protected areas and land rights of the research done. The rationale of the research: the context, the problem, the aim, scope and the design of the methodology to carry out the research, is briefly described in this chapter.

Chapter 2: Literature review

This chapter provides relevant information to understand the conflict between the establishment of a protected area, such as national parks and the rights people have over land and natural resources in those sensitive areas. The theoretical framework is elaborated in land rights and environmental protection, conflicts between people and protected areas, policy instruments and protected areas in Tanzania.

Chapter 3: Research Methodology

This chapter includes a description of how the fieldwork using a case study research methodology was carried out, the justification of the type of methodology applied and the description of the sources of evidences that were gathered. The fieldwork area and the establishment of SANAPA are also introduced in this chapter.

Chapter 4: Analysis of the interaction between Saadani National Park and land rights of local villagers around it, according to the DPSIR framework.

This chapter provides the identification and description of the elements under each category of the DPSIR conceptual framework that better illustrates the effect of SANAPA over rights to land and land resources of local villagers.

Chapter 5: Modelling stakeholders' perception in DANA

In this chapter, the relevant actors and its perceptions graphs regarding the establishment of SANAPA are depicted. A cross-analysis of these perceptions graphs allowed analysing and explaining the occurrence of conflicts in the actions done by different actors and some possible instruments considered as suitable to be introduced in order to reduce the effects of the establishment of the national park.

Chapter 6: Discussion

This chapter presents the arguments and the interpretation of the analysis done in Chapters 4 and 5. The findings are contrasted with theoretical assumptions.

Chapter 7: Conclusion and Recommendations

This final chapter offers a wrapping up about the research issue and the important of the new assessment. It also indicates new lines of research.

2. Literature review

2.1. Introduction

This chapter presents the literature review, encompassing the main subjects that form the theoretical background for the research. Section 2.2 introduces the disagreement between land rights and environmental protection, bringing the challenge of harmonising individual interests with definition of protected areas and the repercussions of such a measure over people livelihoods and right to stay (i.e., enforcement of displacement). The following Section 2.3 brings up some effects of the displacement of right-holders by addressing conflicts, in its different types, and protected areas. The role of policy instruments in the attempt of overcoming the conflicts is then dealt with in Section 2.4, followed by experiences around the world on the establishment of protected areas (see Section 2.5) and the situation of Tanzania on this matter is eventually presented in Section 2.6.

2.2. Land rights and environmetal protection

Although environmental protection is an issue that generates worldwide interest, it involves significantly debate due to the imposition of restrictions on human actions, involving limitations to different types of rights over diverse natural resources including land. It is not difficult to infer that those restrictions stimulate resistance when either economic productivity of land or established way of life is disturbed (Doremus 2003).

On the other hand, protection of the Environment on private lands and lands where private people hold rights embodies both a challenge and an opportunity (Shogren, Parkhurst et al. 2003) for any government. The challenge is to integrate and deal with different likely arrangement of rights: "property rights, access rights, harvesting rights, management rights, exclusion rights and alienation rights" (Sandberg 2007) among others; the opportunity is the inherent level of care accorded to the Environment brought up by right to land and land resources (The United Republic of Tanzania 1997).

Among the range of available alternatives for environmental protection, the establishment of protected areas – such as national parks (Cernea and Schmidt-Soltau 2006) and wildlife reserves – has been a largely accepted way taken by national and international organisations (Udaya Sekhar 2003). But its establishment, without doubt, carry changes in the use of resources for local people, hence its acceptance towards protected areas resides on the harmonization of individual interests and the goals of the Environment conservation (Wallner 2003).

The International Union for Conservation of Nature (IUCN 2009) defines a protected area as "*an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means*". The institution of national parks has most likely facilitated the task of prevention of loss of biodiversity

and wildlife destruction caused by development and land conversion. But neglecting the principle of opportunity discusses by Shogren, this kind of policy has some adverse effects. Due to the level of enforcement these areas have, right holders – particularly in developing countries – are susceptible to the establishment of such areas (Skonhoft 1998). They do not only lose their access to natural resources, resulting in most of the times in forced livelihood's changes, but also they are exposed to forced displacement: *"compulsory removal initiated when a project's need for 'right of way' is deemed to override the 'right to stay' of the inhabiting populations"* (Cernea and Schmidt-Soltau 2006).

2.3. Conflicts between people and protected areas

Factors like: landlessness, joblessness, homelessness, marginalisation, food insecurity, increased morbidity and mortality, loss of access to common property, and social disarticulation, are commonly associated with population displacements after the establishment of a protected area (Cernea and Schmidt-Soltau 2006). Whether the effect caused by it does not go with a targeted counter-risk strategy, for the most part of the cases, there is a drop of the project's benefits (Cernea and Schmidt-Soltau 2006).

In general displacement from protected areas, which in most of the cases are done at the request of a high social good, will involve costly and complex compensation arrangements if this procedure is undertaken properly (Schmidt-Soltau and Brockington 2007). This leads also to a situation of conflict: which for the purpose of this document is understood as any situation that represents disagreement of requirements and interests between an environmental measure and right-holders.

Additionally, according to the nature and types of disagreement, four different categories of conflicts can be faced: conflicts of interest, conflicts of rights, conflicts of facts and conflicts of value (Vatn 2005). The first one involves disagreement about costs and gains; the second one implies competition between rights which usually are not clearly defined, and it is usual for many environmental issues; in the third type the disagreement is about technical subjects like use or effect of the environmental measures; and the last one suggests disagreements about which values are involved, whether the environmental measures is meaningful to all stakeholders and also the status of each of them in the process (Bergseng and Vatn 2009).

Several studies (Songorwa 1999; Langholz and Lassoie 2001; Lindsey, du Toit et al. 2005) illustrate how the acceptance of protected areas by local people depends on harmonising their own interest with the goals of the natural reserve. In general initiatives based on buffer zones surrounding protected areas are developed such that there are no sustainable livelihood options for the local communities, but with the merely intention of dissipating the resistance of people to the establishment of protected areas (Wells 1992).

The dynamics between local communities coping strategies and the conservation efforts are quite complex (Zérah 2007), people dwelling in the vicinity of protected areas' boundaries normally pay high costs and receive little in return, consequently expansion of agricultural frontiers, illegal hunting and logging, fuel wood collection and uncontrolled burning by the affected local communities lead to negative impacts on protected areas (Wells 1992; Cernea and Schmidt-Soltau 2006).

The way local people behave and interact with the wildlife to which they live close to, and also with the agency that manages and has the legal property rights over this wildlife, are factors that play a central role when taking into account natural resources management in Africa (Johnannesen 2004), specifically in this context Tanzania. Frequently this interaction embodies conflicting interests for both actors: they claim their rights to bring in the benefits of the vast amount of wildlife resources (Swansom 1992; Johnannesen 2004).

Furthermore in the incidence of insecurity about land rights and resources in general, either caused by contradiction between government agencies, their lack of capacity to enforce environmental regulations, and also due to social and political factors, people is usually prompt in accessing resources in protected areas, e.g. timber (Puppim de Oliveira 2008).

2.4. Policy Instruments

Accomplishing environmental protection is a task that governments can perform with the adoption of several and different approaches; considering as well that the private sector also brings into play environmental protection approaches, ideally both, state and the private sector should join efforts (Doremus 2003). To confer incentives to local communities is a successful approach that enhances both the management and the protection of natural resources; they do not only live close to protected natural resources but also they are a central stake in the issue (Petersen and Sandhövel 2001).

In this context, policy instruments mean those tools that policy-making may use, aiming at achieve the policy objectives and to overcome the pressure and conflicts in the implementation of the policy. The instruments are classified into those “using markets”: such as subsidy reduction, taxes, fees; “creating markets”: which allow outline rights over natural resources; “environmental regulations”: including licenses, standards, and bans; and “engaging the public”: mechanism like community participation (Sterner 2003).

The acquisition of land rights is a frequent strategy adapted by governments for the establishment of protected areas such as parks. According to the situation in place, the way it is done may vary from a voluntary basis, through donation or purchase at a mutually agreed price, to condemnation, which let the government to oblige the sale at market price (Doremus 2003).

There is not unique formula to select the suitable approach to reach the multi-functional goals that environmental protection seek for; the context, country, land tenure, government influence are some of the factors that will lead to some particular strategies (Cubbage, Harou et al. 2007) but whatever conservation approach is taken, rights holders – and in general those who have been disturbed with the establishment of the protected areas – should be informed, educated and taken into account (Van Gossum, Luyssaert et al. 2005). Sensitivity to the specific conservation goals and the local context and continuous monitoring are also key issues (Wells 1992).

Some principles of ‘good governance’ as legitimacy, transparency, accountability, inclusiveness, fairness, connectivity and resilience, discussed in (Lockwood 2009), promise also to contribute to the potential success and tolerance of protected areas. They might be considered among the variety of arrangements concerning rights and responsibilities.

2.5. Protected Areas and Land Rights: Experiences Around the World

Experiences regarding protected areas particularly national parks can be found worldwide. They vary from those in which the responsibility is primarily in the hands of the state to those which include partnership and co-management, among others. We describe and comment some examples to show the conflicts as well as the benefits of the establishment of such protected areas.

In Madagascar, according to the study of (Ferraro 2002), the establishment of Ranomafana National Park is believed to be related to the enhancement of the trend of secondary forest outside the park: from communal to individual rights. As a consequence those who depend on collection of these resources, mostly poor people, were harmed. The author also argues that benefits from tourism in the park are sporadic and perceived for the very close neighbours of the main road.

The experience in South Africa, discussed in (Ramutsindela 2003), evidences the conflicts faced by the government in the establishment of protected areas along the country: people who were forced to leave their lands in the name of environmental conservation, claimed their lands back. As the document explains, communities were allowed to have property rights inside the protected areas with no-occupation and with restrictions of use, this to guarantee the communities livelihoods and participation in the process. But of course, due to the heterogeneity of the concern of the claimants, conflicts of interest are faced by park authorities.

Opposing a familiar argument regarding the economical benefits a national park can provide, (Stræde and Treue 2006) shows evidence about the great economical advantages encountered by villagers surrounding Royal Chitwan National Park in Nepal. It considered also the villagers' resettlement, as a threat not for the economy of the villagers but for their culture due to the changes in livelihood. The need of environmental conservation, in one hand, and the requirement of local people to access the resources they had right to, on the other hand, claims the implementation of a 'multi-faceted approach' as it is expressed by the authors.

Despite of the degree of protection of a national park, it seems that interaction of local people and park – exercising traditional rights for the access of natural resources – remains an unavoidable issue. A report about Korup National Park in Cameroon by (Mbile, Vabi et al. 2005) shows that regardless the location of the settlements: whether it is inside or outside, people continue to consider the park their main source of resources – despite the restrictions imposed. Also evidence is provided about the disadvantages of a management with low or non-participation of local people: efforts to protect the Environment, particularly in this case the wildlife, do not thrive.

Udaya Sekhar (2003) state that evidence has been provided about the fact that villagers do approve environmental preservation in its general concept and they know the potential of tourism business in a protected area, all despite having missed their traditional rights in Sariska Tiger Reserve in India. Also factors as village distance from the protected area, direct benefits received by villagers due to this areas as well as size of the area owned or settled in, among others, are relevant variables to define the attitudes toward the protected areas in question.

The reality faced in the ground by different national parks' authorities, e.g. the close relationship of local communities with natural resources inside national parks, have made them to realized the significance of fixing together the management of the park with 'local communities perceptions, capacities and wishes' (Mbile, Vabi et al. 2005)

2.6. Protected Areas in Tanzania

The experiences in Tanzania are not far different from all those already presented. In Serengeti National Park, the largest one out of a total of 14 national parks in the country, a study reveals the close relation between land ownership and villagers' view of benefits (Kaltenborn, Nyahongo et al. 2008).

It is also argued that people express more received benefits when they have enough access and rights to land and natural resources. In a more detailed analysis, variables such as level of conflict, lack of water and participation in conservation projects were jointly associated with the local people's perception regarding protected areas, as well as regarding the Serengeti National Park (Kideghesho, Røskaft et al. 2007).

The current structure of wildlife protected areas in Tanzania includes national parks, game reserves and controlled areas (Figure 2-1). This networks is the base of Tanzanian's wildlife use industry (The United Republic of Tanzania 1998). The main forms of this industry are: game viewing, tourist hunting, resident hunting, ranching and farming (Shemwetta and Kideghesho 2000).

Adapted from commonswikimeadia.org

Figure 2-1: Map of protected areas in Tanzania

Based on the scheme of a national park, as an area free of human interests, they can be described as the protected areas with the highest level of nature protection due to the restriction of human activities, (Wanitzek and Sippel 1998). The Minister of Natural Resources and Tourism of Tanzania (MNRT) attending the recommendation of the National Environmental Advisory Committee (NEAC) may declare any area of land which is ecologically fragile or sensitive to be an environmental protected area (The United Republic of Tanzania 1998).

In Tanzania the management of issues involving the Environment is carried out by the Office of the Vice President - Division of the Environment, with the basis of a huge legislation pillar, lead by the EMA of 2004 (Pallangyo 2007). The Wildlife Conservation Act of 1974 rules the wildlife management in Tanzania and the establishment, control and administration of national parks in Tanzania is done under the provision of the National Parks Ordinance, which sets up the organisation identified today as Tanzanian National Parks(Tanapa 2008).

Any previous claims on the land and all existing rights are vested in the president, as soon as an area is stated a national park (Tanzania National Parks and Department of Planning and Projects Development 2003). In fact previous the issuing of the National Parks Ordinance of 1959, the existing legislation regarding national parks – National Parks Ordinance of 1948 – allowed the entrance and residence inside a national park to those who were born or ordinarily dwelled or had any right over immovable properties inside a national park. However, that was changed in 1959 and all the rights were extinguished (Wanitzek and Sippel 1998).

Moreover the National Land Policy (NLP) (1997) of Tanzania include the provision of *"full, fair and prompt"* compensation for land acquisition, guided by the principle of *"opportunity cost"* when the acquisition is done in the public interest, e.g. a national park. Nonetheless the same document recognizes the weakness of the existing provisions on compensation leading to complaints about rates, delays in payment and the non-employment of alternative assessment techniques.

Generally speaking Tanzanians highly approved the establishment of protected areas for considering them part of the country's national heritage (Wanitzek and Sippel 1998), but as it has been previously discussed the story might be different for those who are the protected area's neighbours. The reported problems concerning wildlife protected areas in Tanzania are conflicts with other land uses, poaching, habitat loss, pollution, global warming and introduction of exotic species. Local communities will usually rely on other land uses as form of livelihood rather than on wildlife, what worsens those problems and leads to a negative perception about wildlife from local people (Shemwetta and Kideghesho 2000).

2.7. Conclusions

Environmental protection by means of establishing protected areas clearly has effect on local people's life, particularly in their different types of rights related to the area in which the measure is implemented. That points to the need for harmonising such rights at the moment of 'putting into practice' the environmental policy of a country through definition of protected areas (see Section 2.2). One of the main issues identified were different kinds of conflicts brought by displacement of people that live in those areas and all the repercussion this eventually have in people's rights and livelihood.

Design of proper policy instruments (see Section 2.4) are normally seen as an avenue in the attempt to solve, or at least minimise, conflicts along with achieving policy's objectives. At any case, an effective environmental protection by protected areas definition demands the acceptance of local people with relation to the implementation of the measure, and that is a harmonisation task that usually can only be met by aligning individual interests with the very ones of the protected are being implemented (see Section 2.3)

Several experiences around the world (see Section 2.5) show that there is always a possibility that 'doing the right' (i.e., protection of Environment), effects that 'are not right' (e.g., affect in livelihoods of people, displacement from their traditional land and so fore) may occur. An example from Tanzania precisely points that people will perceive benefits from defining protected areas when they still have access to enough resources and rights to land. The referred country indeed represents a unique opportunity to investigate this kind of issue: conflict between people and protected areas; as Tanzania has a large part of its land covered by different types of protected areas (see Section 2.6).

3. Research Methodology

3.1. Introduction

Being one of the preferred and at the same time challenging research strategies in social science research (Yin 2003), the case study in this study was carried out to look into the relations that have taken place between SANAPA and land rights of local people living around it. Section 3.2 narrates the approach taken to carry out this research and Section 3.3 introduces the area of study. The empirical data collected, process described in Section 3.4, was the basis to build a conceptual framework of the drivers, pressures, state, impacts and response – DPSIR of such a system and also to model and analyse the perceptions of the stakeholders involved (see Section 3.6). The ending sections of this chapter include the description of the limitations involved during the data collection (see Section 3.5), the validation of the methods use to accomplish this research (see Section 3.7) and the concluding remarks in Section 3.8.

3.2. Research approach

Taking into account that a case study favours the inquiry of a current observable fact inside its real-life context (Yin 2003), this research strategy was considered the most relevant to be applied to answer the questions posted in this study. Despite some concerns about case study research like: lack of rigor, little basis for scientific generalisation and long-time requirements (Yin 2003), a case study shows advantageous comprehensiveness needed to deal with many variables of interest and multiple sources of evidence as it is required in this research. To address the research questions, the case study was designed as a single-case (Yin 2003) following the rationale of being representative of the circumstances and conditions needed.

As it has been discussed in Chapter 2, implementation of environmental measures such as the establishment of a high-level protected area like a national park inevitably has some effects, in most of the cases negative, to people living in (or used to live in) and people settled around it. This situation may turn into conflicts and most likely the failure of the environmental measure in reaching the objectives of wildlife protection.

The fieldwork required a month preparation (pre-fieldwork) time in which the initial questionnaires were designed, some possible field areas were outlined and some relevant stakeholders and information regarding national parks in Tanzania were also outlined. Three weeks were spent in the field (during the month of October) for data collection. The research was founded on site visits and semi-structured interviews of local people complemented by sources that included reports and dissertations. It was not possible to interview any Tanzania National Parks(Tanapa)'s staff or either gets any data from them.

When it was possible, discussions were held with individuals with relevant knowledge, researchers, land officer and staff from some Tanzania environmental organisations.

3.3. Study area

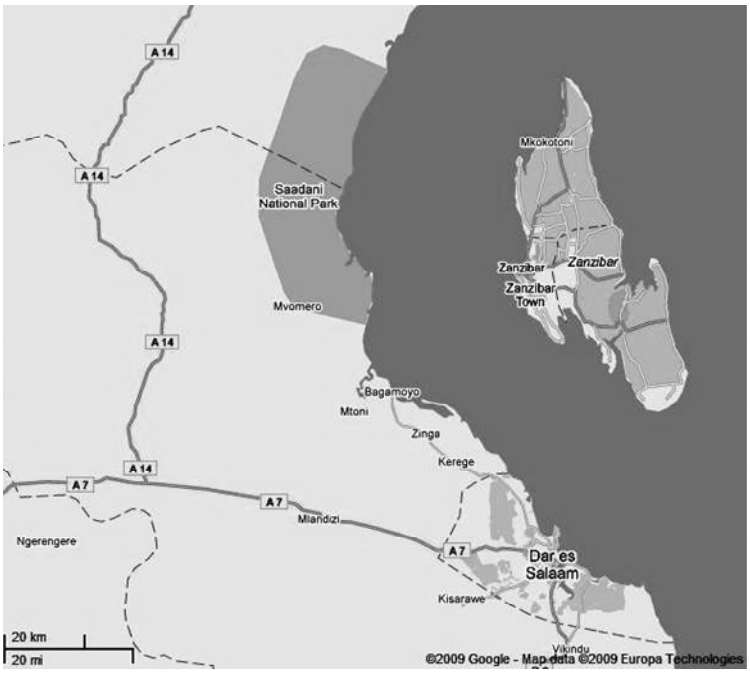
3.3.1. Selection of the study area

The fieldwork was conducted in the city of Dar es Salaam, the small villages of Uvinje and Buyuni – inside the park – and Saadani Village – outside the park. These three villages are located in Bagamoyo district. The aim of it was to collect empirical data that allow understanding what have been the effects of the establishment of a national park in the rights people used to have and/or still have over that land.

The main criteria for selection of the study area were: high level of enforcement of the environmental measures in place and presence of conflicts or observable effects in local people and their rights. With the assistance of staff from Ardhi University (ARU), SANAPA was selected as the protected area to carry out the research among other possible field areas like Ngorongoro Conservation Area, Mikumi National Park and Marine Protected Areas, because it fulfils both of the main established criteria. This area presents a unique graduated increased enforcement of an environmental measure: from open access lands to game reserve in 1969 and from this to national park in 2005; with this final degree of protection established just a couple of years ago, making feasible to get some relevant empirical data about the recent effect caused. The proximity to Dar es Salaam was also a criterion taken into account.

3.3.2. Location of the study area

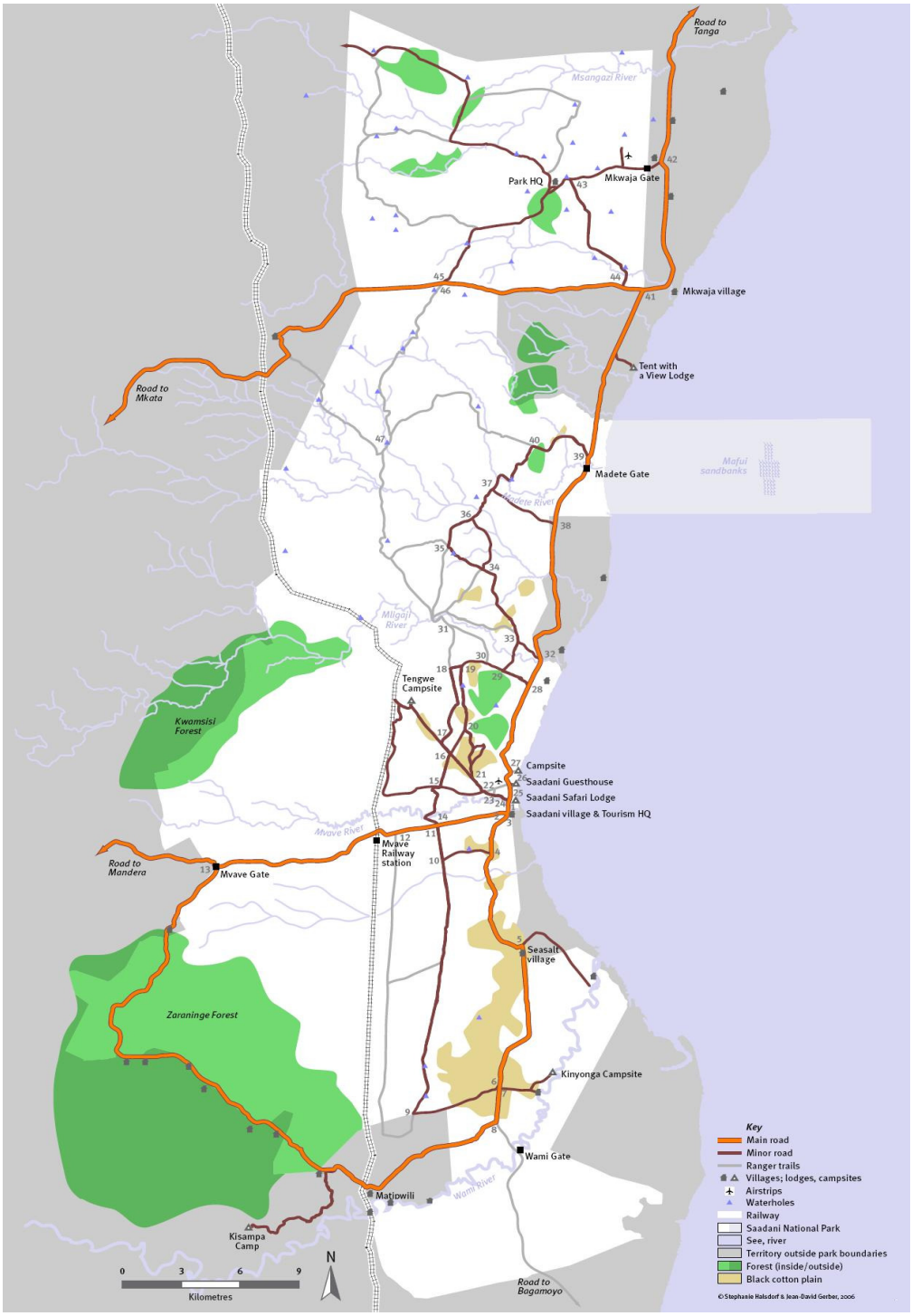
SANAPA is located around 100 Km northwest of Dar es Salaam on the Tanzanian coast (Figure 3-1) and it includes areas of the districts of Pangani, Handeni and Bagamoyo (Tanapa 2008). The park has an extension of around 1100 Km^2 (Saadani National Park 2007).



Source: Google maps

Figure 3-1: Location of field area

Placed in the east of the park, Saadani Village was a previous slave trading centre in East-Africa and now it is a current small fishing village with about 800 inhabitants. Due to natural features such as Wami River, to reach this village is needed to go over 200 Km from Dar es Salaam (Saadani National Park 2007). Figure 3-2 provides an overview of SANAPA routes, administrative offices and Saadani village among other features.



Source: (Saadani National Park 2007)

Figure 3-2: Map of SANAPA

3.4. Data Collection

The first principle of data collection discussed by Yin (2003) refers to the use of multiple sources of evidence to tackle a wider range of issues regarding the research topic. This is an attempt to make the findings or conclusions of the research more truthful. Following this initiative, the subsequent subsections describe in detail the multiple sources of data, including its evidence during the fieldwork.

3.4.1. Interviews

This is one of the most fundamentals supply of data about human affairs (Yin 2003), in the set of primary sources. In the context of this research, interviews were the main source of data to capture the views and perceptions of local people settled in and close by SANAPA and also to understand with the help of some 'external actors' the social, economical and environmental process that have taken place in the establishment of SANAPA.

The interviews were conducted using a semi-structured questionnaire of two natures: open-ended and a focused interview (see Appendix A). The open-ended interviews were carried out with local villagers from Saadani, Uvinje and Buyuni Villages. The informants, who were local leaders, randomly selected villagers and villagers that other people suggested to talk to were all asked in Swahili. With the help of an interpreter (a native speaker), the questions were based on the establishment of SANAPA, changes in access of resources and land rights and in general about villagers' opinions and feelings regarding this issue. The interviews were conducted both individually and in small groups. For a summary of results see Appendix B.

The interpreter was carefully informed beforehand about the aim and scope of the research, and also the questions were discussed to avoid misunderstandings in the formulation of the questions. The translation of the questions and answers was done right away by the interpreter so that it was possible whenever needed to post any follow-up question or change something according the case. Each interview took in average one hour and a half.

The selection of the villages was done based on two criteria: proximity to the park, giving priority to the closest one, in this case Saadani – placed just right in the border of the park – and full location within the park border, like Uvinje and Buyuni. It was assumed that people living in those villages were or has been disturbed by the establishment of the national park. In general, people interviewed are users of the national park's resources and people who were land occupants of what is now SANAPA's territory as well as those who remained there.

The number of villagers interviewed is somewhat low, just 10 in Saadani Village, which represents around 1.25% of the population of that village and 2 group interviews of around 5 people, which represents around 2.5% of the population in Buyuni and Uvinje (see Appendix B4) . Despite of it, the sample was considered sufficient to build the conceptual framework and to model the stakeholders' views, taking into account the accessibility limitations of the area as well as the representativeness in the perceptions of the different villagers influenced by the establishment of SANAPA, provided that it is composed by at least one per each of the following:

- People who used to dwell inside the park and were shifted from it;

- People who continues living inside the park after its establishment;
- People who have been living outside and close to the game reserve before and now to SANAPA; and
- People who moved to Saadani looking for opportunities that the park would bring.

The focused interviews were carried out in a conversational manner with respondents that though are not entirely immersed in the issue here analysed; because of their knowledge they provided relevant opinions to understand the process that have taken place. These respondents were individuals with relevant knowledge from the University of Dar es Salaam, SANAPA previous researchers, the land officer from Bagamoyo District and staff from Wildlife Division and Ministry of Natural Resources and Tourism.

3.4.2. Observations

During the field visit to the study area, it was possible to hold casual-direct observations in the three villages where the interviews took place: Saadani, Uvinje and Buyuni. The observations allowed capturing the interaction of local people with the park, both inside and outside of it. The observations were also done in TANAPA Offices in SADANI: Tourism Headquarter in Saadani Village and Park Headquarter close to Kmwaja Gate, even though TANAPA's staff refused to be interviewed and to provide any kind of data. Including non-verbal reactions as well as events and facts witnessed, added a new dimension to understand the conflict-relation between SANAPA and local land-rights holders (See Appendix B).

3.4.3. Secondary sources

To complete the variety of sources of evidence in this research, some secondary data were collected. Although this kind of data might not be always accurate and report bias from its author(s), it allows upholding data from other sources and providing a stable qualitative and quantitative (e.g. census) source of data. It consists of articles, legislation, reports, dissertation, among others as it shown in Table 3-1.

Table 3-1: Secondary sources

Documentation collected	***Content***
Census data	Data from the housing and population census of 2002 in Tanzania.
Reports from Saadani Conservation and Development Program (SCDP)	Options and conclusions to optimise Saadani protected area's future management.
Saadani an introduction to a National Park	TANAPA's paper about the history of Saadani protected area, Saadani Game Reserve (SGR) and wildlife.

Documentation collected	*Content*
Saadani National Park Pamphlet	Information about natural ecosystem, tourism information and park regulations.
Experiences of land use conflict management strategies in rural Tanzania.	Dissertation about protection and utilisation of Saadani ecosystem.
Saadani National Park Management Zone Plan	Physical and biological environment, management and visitor environment, establishment history, planning perspectives, resources.
Legislation concerning National Parks	EMA, National Parks Ordinance, Wildlife Act.

3.5. Limitation of the data collection

The main limitation encountered in this research was the refusal from SANAPA's staff to either answer any question or to provide any kind of information concerning this research. The SANAPA's chief park warden expressed that "the information is very sensitive" and only under previous authorisation from TANAPA the data can be released. With the assistance of UCLAS Department from ARU, a formal request was formulated to this organisation placed in Arusha, a city of northern Tanzania and approximately 640 Km far from Dar es Salaam. However, until the current date, they are not given green light to proceed with the collection of data. Paradoxically, most officers from most of the organisations intended to interview also referred to TANAPA to gather data.

Time was also a limitation in this research. Not only because of the already-known short fieldwork time of three weeks, but because some unfortunate health issues constrained the workable time to two weeks. Seeking for authorisation, which in most of the cases included a hierarchical process of several requests, to collect the data from all the organisations including libraries, also reduced considerably the time for data collection, all the introduction letters had to be issued by ARU, and those from ITC were not recognised.

The accessibility of the area of study was a constraint as well. To reach and move around the park private transportation was needed, since there is no public transportation in the area, and the different points needed to visit are quite distant to each other. ARU kindly availed a vehicle to conduct the fieldwork in the park, but for only two days.

The local language, Swahili, represented a barrier to go throughout the interviews conducted in the park, to talk with some front desk staff, to understand some documentation observed and in general in day-life activities. Due to it, interviews had to be done with the assistance of a translator, which added a limitation in the quality of the data, the direct data (responses) from villagers, was collected rather by a third part. In some cases, it was observed that the translation did not correspond entirely with the respondent's reply.

3.6. Data Analysis

The purpose of this study is to understand the cause-effect relation between SANAPA and right holders – defined in this context as the system –, to set some indicators of this relation and to propose some possible instruments to reduce the impact of the park over people. To do so, first a method that allows the representation of the different components of the system and their interactions was required: DPSIR, in this case.

This method links in a simple way the processes that are taken part in the issues here analysed and their consequences. In other words, it allowed to use a flow of processes to explain the interrelation between human activities and environment (Nilsson, Wiklund et al. 2009). Five categories, logically bonded, had to be identified with this methodology: Driving forces, Pressure, State, Impact and Responses (European Environment Agency 1999). The logic chased to identify the DPSIR categories in the subject of study, according to the data and the information collected during fieldwork, is presented in Table 3-2.

Table 3-2: Description of the activities for identification of each DPSIR category

Step	***Category addressed***
Definition of activities, behaviours and process that were noticed to have a Pressure the system.	Driving Forces
Identification of the way in which the State of the system is affected by the Driving Forces.	Pressures
Description of the current situation.	State
Explanation of the consequences and effects of the State.	Impact
Determination of the efforts – societal response – to solve the uncounted situation.	Response

DPSIR is a quite established and frequently employed framework to understand the roots and scope of environmental problems (Niemeijer and de Groot 2008). Many studies have applied the method, for instance, in determining the elements that affect the management of Marine Protected Areas in Tabarca, Spain (Ojeda-Martínez, Giménez Casalduero et al. 2009); in the establishment of the impact of urban sprawl on water balance and policies in Leipzirg, Germany (Haase and Nuissl 2007); in understanding the main cause and effect relationship of subsurface environmental issues like excessive groundwater extraction, land subsidence and groundwater contamination and urbanisation among the Asian cities of Bangkok, Jakarta, Manila, Osaka, Seoul, Taipei and Tokyo (Jago-on, Kaneko et al. 2009); in analysing climate change and its consequences to biodiversity (Omann, Stocker et al. 2009); in identifying the appropriate indicators to evaluate the problem related reef fishing activities in Kenya (Mangi, Roberts et al. 2007) and many more could be listed.

However, and as it is discussed in (Svarstad, Petersen et al. 2008), most of the applications of this framework are concentrated merely on environmental issues with little attention given to social and

economic issues. Taking into account the subject dealt in this research includes mostly social and some economic factors related with the establishment of a third one: environmental measures, the framework here developed is adapted and focused on the establishment of SANAPA and the consequences that brought to local right holders.

Table 3-3 evidences the focus given to the conceptual framework in the context of this research. Considering that the changes were done in the issue represented but not in the essence of the framework: "*relationships between the elements that introduce the dynamics into the framework and bring about changes*" (Gabrielsen 2003), it is assumed that the framework used is still reliable. As a matter of fact, since its very beginning in 1979 the conceptual framework known today as DPSIR, has had different adaptations in order to make it suitable for the respective approach used, as described in (Gabrielsen 2003).

Table 3-3: Definition of original and adapted DPSIR categories

Category	***Original definition (Gabrielsen 2003)***	***Definitions in the context of this research***
Driving Forces	"…social, demographic and economic developments in societies and the corresponding changes in lifestyles, overall levels of consumption and production patterns…"	Social, economical and environmental elements that are the ground for variations in the system established by SANAPA and local right holders.
Pressures	"…developments in release of substances (emissions), physical and biological agents, the use of resources and the use of land by human activities…"	Occurrence of events that affect or have been affected the conditions regarding the implementation of the environmental measures and the rights of local communities.
State	"…description of the quantity and quality of physical phenomena(…), biological phenomena(…) and chemical phenomena in a certain area"	Description of the conditions observed in the communities surrounding the protected areas and which are associated to the establishment of the SANAPA.
Impact	"…parameters that directly reflect changes in environmental use functions by humans"	Elements in local communities, which reveal the consequences of the changes in the state as a result of the applied pressures (SANAPA establishment, increase need of resources, settlements surrounding the park).
Response	"Refer to responses by groups (and individuals) in society, as well as government attempts to prevent, compensate, ameliorate or adapt to changes in the state of the environment"	Responses (desired or performed) by TANAPA, local communities or any other actor involved in order to alleviate or balance the current condition.

Once the data collected on the field was structured under the different categories that DPSIR methodology proposed, the following step is the identification of the indicators of variables, based in the

data that was collected. By indicators was understood in this context any measure that allows illustrating and representing attributes of a system (Fedra 2004), more specifically a physical, social or economic system(Veleva and Ellenbecker 2001). According to (Gallopín 1997) the preferred indicators are those that aim to distinguish, quantify and report in a simple way important information for many different purposes. In this case, the purpose is to help understanding the cause-effect relationship between the different components of the system defined by SANAPA and the local right holders.

The indicators here defined are quantitative, keeping the essence of any indicator: to quantify; but also qualitative, in the case of those characteristics relevant in the study with non-quantifying essence, e.g. representativeness of local people. The development of indicators gave way to the model of the stakeholders' perceptions. This analysis is based in an actor-oriented approach widely use in social sciences, which allows the determination of "*internal and external factors and relationships*" as well as "*accounts of live-worlds, strategies and rationalities of actors in different social arenas"* (Long 1992). This approach implies the understanding of actors as both human and non-human (e.g. organisations), and the careful identification and characterisation of actors and theirs goals (Woods 1998).

The assumption behind the use of such approach in this research is that, once the perceptions and views of different actors or stakeholders involved in a policy issue are exposed (in a model in this case), useful understanding is gained to identifying the core issues that develop in conflicts and propose some elements that might reduce the level of conflicts between the goals of the stakeholders involved. However, when the analysis is based on perceptions, it is quite hard to talk about 'objective reality'(Bots 1999), therefore the conception of the model here presented is fully based on inferences about the data provided by the interviewees.

The selected tool to model the stakeholder's perceptions was DANA, software developed at Delft University of Technology by Pieter W.G. Bots. A full overview of the software can be found in http://dana.actoranalysis.com/. In DANA, 'causal relations diagrams' are used to model the perceptions of the stakeholders; those diagrams are no more than factors and mechanisms relevant to each actor plus causal relations between them (Hermans 2004). The input information required to build those diagrams came mainly from the interviews, but also from secondary sources data. The latter was the case of TANAPA's perception graph, once this organization refused to provide data. Results of the DPSIR analysis were as well useful to build the perception graphs presented, as a high-level description of the system established between SANAPA and affected local communities.

The perceptions of each actor here discussed need to be viewed taking into account the limited data available and the persons interviewed (e.g. it is not feasible to interview each villager from Saadani, Uvinje and Buyuni). It is then assumed that the perceptions taken from the interviews represent the perceptions of the certain actor type in the model.

The final step of the analysis was to include some possible instruments to reduce the level of conflict between stakeholders, in the original perception graph obtained. The feasibility of the application of those instruments is not part of the scope of this research.

3.7. Validation of methods

Four logical tests were used to establish the quality of the empirical data collected, as suggested in (Yin 2003). These tests are: Construct validity, internal validity, external validity and reliability and they are presented in the following table (Table 3-4).

Table 3-4: Case study tactics

Tests	***Case Study Tactic***	***Actions done***	***Phase of research in which tactic occurs***
Construct validity	Use of multiple sources of evidence	Interviews, observation and collection of secondary data collection.	Data collection
	Establish chain of evidence	Description of the information and data obtained, process carried out, the observations done.	Data collection
Internal validity	Do explanation building	Establishment of the causal links between the categories of the DPSIR framework based on the interviews carried out, documentation collected and observations done during fieldwork.	Data analysis in chapter 4.
	Use logic models	Modelling of perceptions of actor involved based on the interviews carried out, documentation collected and observations done during fieldwork	Data analysis in chapter 5.
External validity	Use theory in single-case studies	The concepts of people perceptions, policy instruments, protected areas, land rights, and conflicts were included in the data collection tools to define a conceptual framework and a cognitive map.	Research Design
Reliability	Develop case study database	The information collected per source, the different observations done and responses of interviews codified are kept in a single database and a summary of the findings is presented as an appendix of this document (Appendix B).	Data collection

Adapted from (Yin 2003)

3.8. Concluding remarks

This chapter outlined the research methods and data collection that took place to apply the chosen methods. An approach that attempted to overcome the limitations of research of type case study was drawn (Section 3.2) by means of enriching as much as possible the sources of evidence for the issues relevant to the problem tackled: conflicts between people and protected areas, particularly in the case of the study area chosen – SANAPA (see Section 3.3). Data sources included interviews and direct observation, as primary sources, plus a set of secondary sources such as legislation, dissertations, relevant bibliography and official governmental data (see Section 3.4)

A discussion of the limitations of the data collected was also presented (see Section 3.5). After that, the data analysis approach was introduced (see Section 3.6), bringing the two main methodologies that take place in the research, namely DPSIR, as a way of understanding the system establishment of SANAPA-people living inside or near outside the national park; and DANA, as a way of modelling the perception of the actors involved in that system. With the output of the two analyses it will be possible to point out indicators for the system, as well as introduce possible instruments aiming at reducing the level of conflict observed, respectively. Finally, the validation of the methods in the context of this research is presented in Section 3.7.

4. Analysis of the interaction between Saadani National Park and land rights of local villagers around it, according to the DPSIR framework

4.1. Introduction

This chapter presents the DPSIR methodology applied to the system established by SANAPA and local right holders in this research. How the DPSIR categories were derived is presented in Section 4.2. The relationship between these different categories is then presented in Section 4.3; the "driving forces" of the system is presented in Section 4.4 as being the population factors, general economy and policies related to environment, land and wildlife. That is followed by the "pressures" (Section 4.5) identified in the system, which lead to a "state" that is then presented (Section 4.6) That gives way to the identified "impacts" (Section 4.7), followed by the "responses" (Section 4.8) that took place in the relationship between the establishment of SANAPA and the rights of the people that live or used to live inside of the park, but also some others possibilities of response not taken so far are introduced. Finally some indicators (Section 4.9) are drawn to explain attributes of the categories of the DPSIR conceptual framework for the case study.

4.2. Deriving DPSIR Categories

DPSIR framework structures the categories in a "chain of events" manner, conceptually starting from external factors that affect the system named as *driving forces*. To develop the framework in this research, however, the starting point was the *state* arisen with the establishment of SANAPA and its implication on land rights of local villagers, which was identified by means of directed observation and interviews carried out in the field.

With the identified current situation it was possible to reason over the data gathered and define what are the *impacts* over local communities with the establishment of the park, as well as to identify the *pressures* that lead to the current situation. *Responses* elements were also established in the same basis; but in this case, not only measures performed but also desired to alleviate the situation found.

Finally, *driving forces* were derived based firstly on literature, in which population and economy are normally found as the primary forces that triggers changes in any system that encompasses human activity. Secondly, in this research particular case, policies that deal with relevant issues that governed the establishment of the park and the subsequent actions, such as eviction of local community and compensations for extinguishment of land rights, were also considered as forces that provoke changes in the situation.

4.3. Relation between the DPSIR categories

The issues, problems and events taking place between SANAPA, local communities and rights to land and land resources of those communities, are described and labelled under each of the five categories of the DPSIR framework: Driving Forces – Pressures – State – Impact – Response. Figure 4-1 present the DPSIR framework with the elements of each category as derived for this research.

The elements are detailed further in this chapter. For now, the focus is on the 'casual link' between these categories that enables to explain the influences and interaction taking place, as depicted in a very simple way in Figure 4-1. Of course, not all possible elements having an influence in the system object of this study are included; this is only an abstraction of what it was observed during the fieldwork and analysed according to the data available.

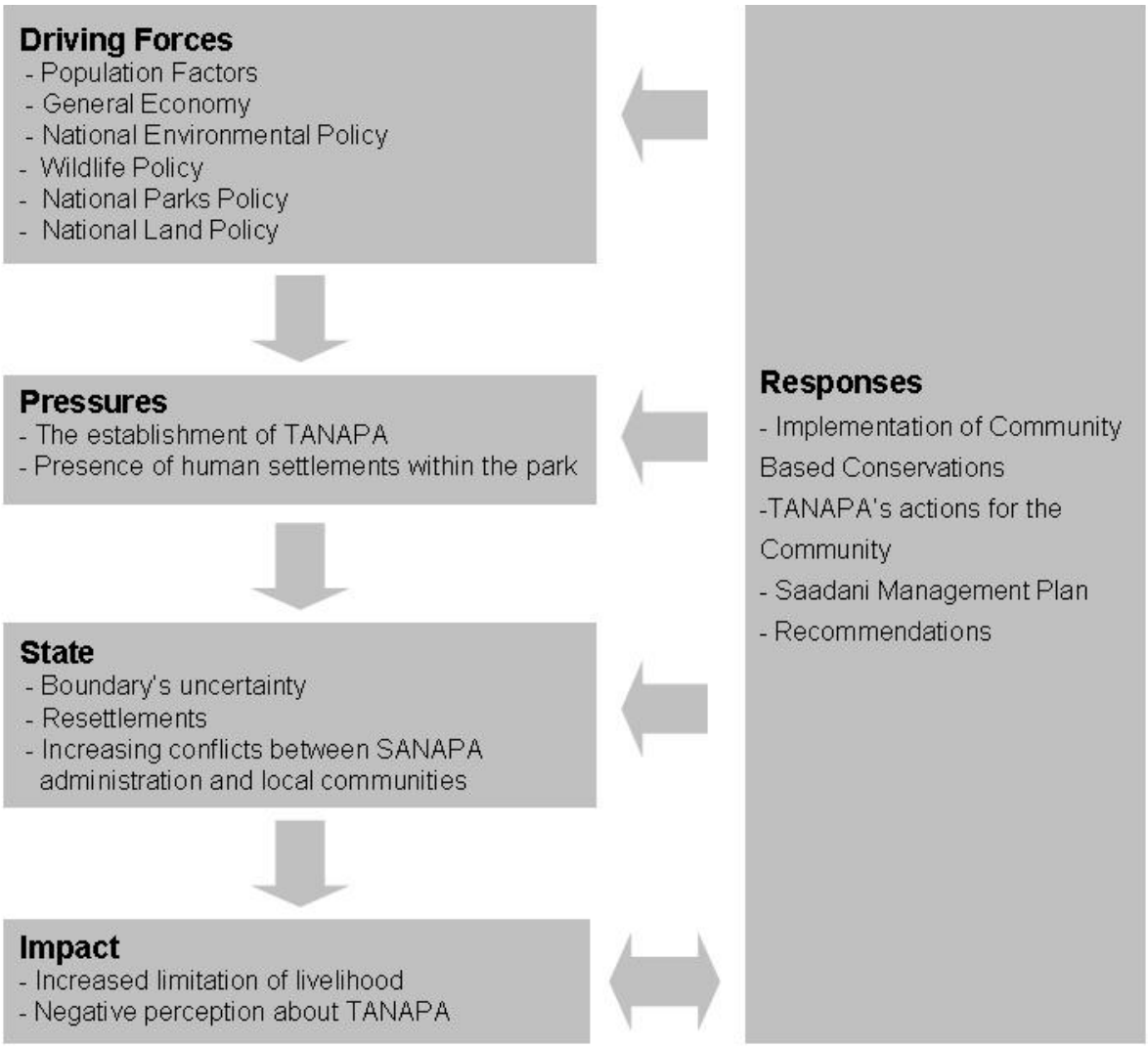


Figure 4-1: The DPSIR framework of the TANAPA – local people's system

The Driving forces are those starting points for effects or changes in the system; corresponding in general to socio-economic leading elements. Giving the system focus of this research, the first elements that came into place were the policies adopted by the government of Tanzania regarding environmental

issues, and more specifically those dealing with wildlife, national park and land. The policies pointed out environmental conservation through the creation of areas where vulnerable and valuable ecosystems must be protected. Those policies, mostly embraced in the late 1990's, were the basis for the current regulating Acts that allow the creation and administration of the network of protected areas already in place in Tanzania, having at its maximum level of protection the so-called national parks. Others issues that were considered as having an effect on the system were the population factors: an increasing irregular-distributed population that together with the general economic of the country, expressed as rural communities devoted to exploitation of natural resources certainly can explain the existence of communities surrounding protected areas. Of course the potential benefits in tourism that such areas have, is also an issue that attracts people to neighbour areas like national parks.

There are two issues which represent the way drivers affected or press the system: the establishment of SANAPA, in one hand, together with lack of communication, resulted in boundary uncertainty for people in Saadani. Once the new area was added to the previous game reserve, according the technical recommendations of the planning unit of TANAPA, and SANAPA was established, people were not told about the area they can use or they cannot, all they know is that the park is its neighbour, and a neighbour they did not ask for, but yet they paid the cost for it. It is not difficult to understand one of the complaints and reason of conflicts between TANAPA and Saadani villagers. On the other hand, the presence of human settlements within the area to be declared as a national park, caused as expected, the resettlement of many families. This was a forced and never discussed resettlement – as people complaint. And of course, that is a source of conflict between TANAPA and villagers, those that were shifted from the park, want to go back; they do not trust SANAPA administration.

The current condition of the system led to some consequences: both boundary uncertainty and resettlements were ones of the sources to increase the limitation of livelihood. People in Saadani, do not know where they can keep their livestock, where they can have some crops or where they can go and collect some natural resources. Similar case for those that were resettled, as they told, they used to be sure where they were living, they had their crops, their animals and the freedom to use and exploit the natural resources, now with the establishment of SANAPA they have to deal with several restrictions regarding the ecosystem protected. At the same time resettlements and conflicts between TANAPA and local communities, have left a lack of trust in the organisation, represented in the negative or poor perception villagers have of it.

Given the state and the impact it causes in the system, some actions were taken or plan to be taken by the central government either through TANAPA, Wildlife Division or both. Such responses deal with one or many of the categories in the DPSIR chain. That is the case of implementation of Community Based Conservation, which based on the environmental policy plans to address the community settle around SANAPA, to reduce the conflicts between people, SANAPA and its administration. People suggested also some recommendations that TANAPA should follow due to the establishment of SANAPA, to improve their lifestyle and improve the communication and the perception people have.

4.4. Driving Forces

Considering the driving forces as the social, economical or environmental elements that are the ground for variations in the system established by SANAPA and local right holders, three broad elements were

identified as back-up forces: Population factors, general economy, environmental, land, wildlife and national parks policies.

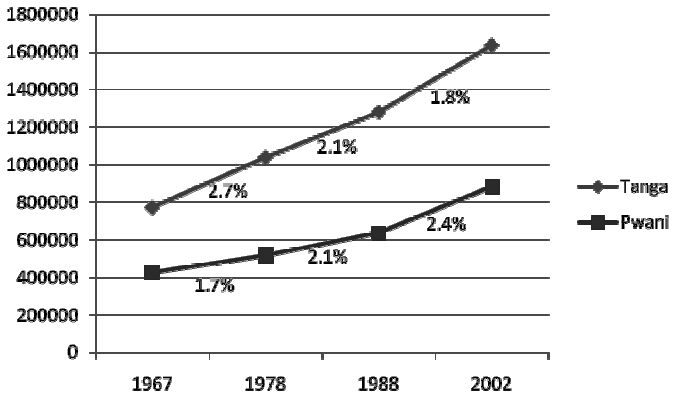
4.4.1. Population Factors

Population factors: size, distribution and composition have a range of implications on the Environment due to the individual need of resources, the changing pressure that migrations bring and the type of stress imposed according to the different societies (Hunter 2000). In the same lines, the National Population Policy of Tanzania (NPoP) identifies the close relationship between population dynamics, resources, environmental protection and development (The United Republic of Tanzania 2006).

Population is a quite dynamic element in Tanzania. The results of different census, carried out first in 1967, then in 1978 and 1988 and lately in 2002, provide evidence of it (NBS 2003). Thaxton (2007) reports, based on the census results, a population growth from a little bit more than 12 million to an estimated 38 million between 1967 and 2005, with an approximately rate of 2.9 percent per year.

Spatial distribution is a very relevant characteristic of the population in Tanzania (The United Republic of Tanzania 2006). The census of 2002 shows an irregular spreading of the population around the 21 regions of the Tanzania mainland and the island of Zanzibar (Madulu 2002). Five regions covering around 18.2 percent of the total area of the country: Mwanza, Shinyanga, Dar es Salaam, Mbeya and Kagera, grouped more than twelve million inhabitants in 2002 – more than two million inhabitants each of them, in other words near 36 percent of the population is concentrated in less than a quarter of the total extension of the country. In the case of Tanga and Pwani, regions were SANAPA is located, about 1.6 million and 885 thousands of people respectively were determined, which represents a distribution of 4.8 and 2.6 percent of the total population in each of these two regions, according to the data obtained in the census of 2002.

However, these numbers have fluctuated over time according to the historical data from the different census in Tanzania, as shown in Figure 4-2:



Data Source: (The United Republic of Tanzania 2002)

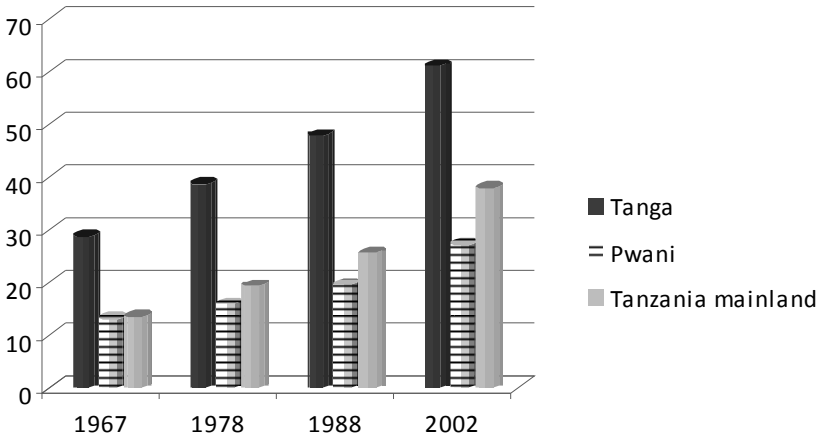
Figure 4-2: Historical inter-censal growth rate for the regions of Tanga and Pwani in Tanzania.

In Tanga region, the population growth rate has been declining from 2.7 percent between 1967 and 1978 till 1.8 percent between 1988 and 2002. Opposite situation can be noticed in Pwani, where the growth rate went from 1.7 percent between 1967 and 1978 till reaching a 2.4 percent between 1988 and 2002.

Although these rates are lower than the general rate of the country during the three inter-censal periods, the population growth in the area has not stopped.

To have a better idea about the population distribution and its fluctuations in Tanzania is worthy to take a look at the concentration of the population over a land area. Normally, the location of settlements supposes the application of certain criteria for its selection by people, and specifically in Tanzania, those factors includes accessibility to social services, availability of land for agricultural purposes and reliable economic activities like mining and fishing, among others (Madulu 2002).

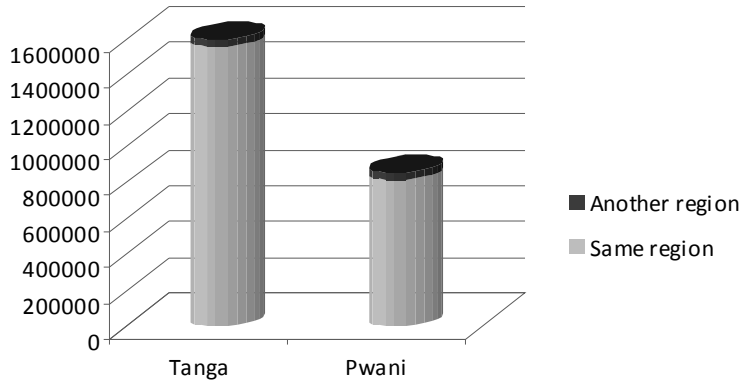
Tanga and Pwani are 26,808 and 32,407 square kilometres respectively. Together they represent around 6.7 percent of the total extension of the country. As discussed before, population around the country has grown; therefore the population density in each region has increased as well. Figure 4-3 shows the population density registered through the different census carried out since 1967. It can be seen that Tanga region has nearly doubled its population density in 35 years, from 29 people per square kilometre in 1967 to 61 in 2002. Similar situation can be observed in Pwani region, which an initial population density of 13 in 1967 was duplicated in 2002.



Data Source: (The United Republic of Tanzania 2002)

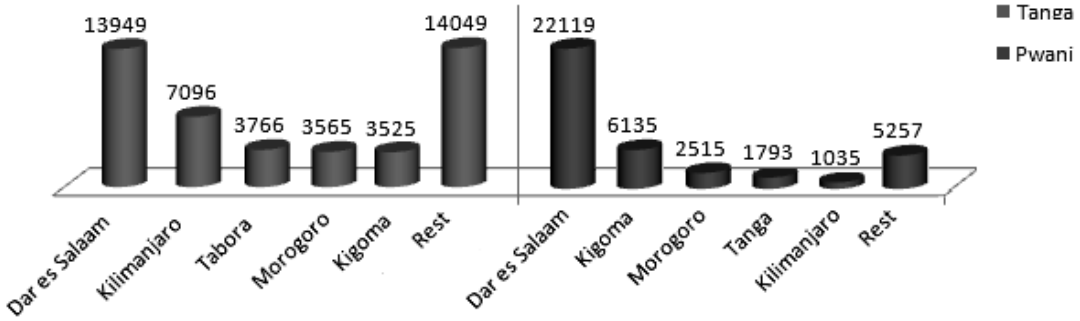
Figure 4-3: Historical population density in the regions of Tanga, Pwani and Tanzania mainland

It was also noticed in the results of the census that there is a small migration of population between regions. In Tanga, 3 percent of the population – 45,950 persons – had a different place of residence prior the implementation of the census surveys (Figure 4-4) and among them, Dar es Salaam and Kilimanjaro are the most popular regions of origins (Figure 4-5b). Around 38,853 persons coming from another regions move to Pwani (Figure 4-4), having as well as Tanga, Dar es Salaam as the frequent place of prior residence for those who moved to Tanga, followed by far for Kigoman and Morongoro (Figure 4-5a) .



Data Source: (The United Republic of Tanzania 2002)

Figure 4-4: Population by prior place of residence in Tanga and Pwani Regions

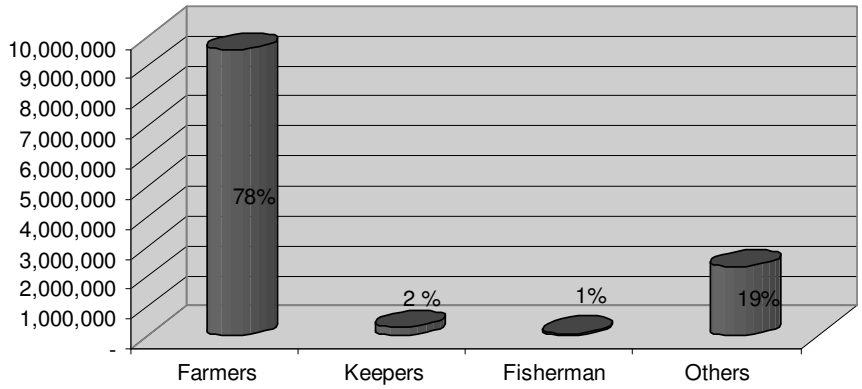


Data Source: (The United Republic of Tanzania 2002)

Figure 4-5: Regions of prior residence in Tanga and Pwani

4.4.2. General Economy

The economy of Tanzania is mainly based on agriculture, particularly in small farms sizing between 0.9 and 3 Hectares (The United Republic of Tanzania 2007). Data from the census of 2002 (Figure 4-6), shows that around 83% of the population in the rural Tanzania is dedicated to farming.



Data Source: (The United Republic of Tanzania 2002)

Figure 4-6: Occupation in rural areas in mainland in Tanzania

In 2007, the report of a economic survey in Tanzania tells about the growth of agriculture activities in a rate of 4.0 percent, which in turn is attributed firstly to the enhancement of crop labours and livestock

keeping , thanks to favourable weather conditions, and secondly to the decline of forest and hunting acts due to the enlarged enforcement of environmental measures (The Ministry of Finance and Economic affairs 2007). Generally in Tanzania, Environment is recognised as an essential element for the economy because is the provider and holder of all natural resources and the basis of initiatives for poverty alleviation (The United Republic of Tanzania 2007).

Tourism is a flourishing subsector in the economy of Tanzania (The United Republic of Tanzania 2007), consisting as in many other African countries, of wildlife attractions such as national parks and game reserves. Such activities take place mostly in Dar es Salaam, in the island of Zanzibar and in the Northern of the country e.g. Serengeti, Ngorongoro, Kilimanjaro, Arusha (Kweka 2009).

According to the observations and information provided by people interviewed, the main livelihood of Saadani village's inhabitants is fishing. A smaller percentage is involved in small business, livestock keeping and agriculture. Fishing is also the major livelihood for villagers in Buyuni, while in Uvinje maize, cassava, potatoes and coconuts crops are the basis of their economy. The fact that the economy of the area is highly dependent on natural resources and consequently on the Environment, makes of this element an important driver in the system, due to the amply discussed relation between economy – environmental protection and environmental protection – land rights.

4.4.3. National environmental policy

In response to the need for environmental guidelines, the government of Tanzania issued in 1997 the NEP. This policy is aimed to tackle land degradation, good quality water availability in both urban and rural zones, contamination of the Environment, wildlife habitats and biodiversity loss, degradation of marine ecosystems and deforestation.

Demographic dynamics, land tenure and biodiversity are just some of the cross-sectoral policies defined in the NEP of Tanzania. The first one put together in a holistic way, population dynamics and environmental matters and the affects of this relation in the use of natural resources, e.g. land, water. With regard to land tenure, the policies stands for integrated land use planning, secure access to land resources and participatory management as a result of the acknowledgement of the importance of *"ownership of land and land resources, access to, and the right to use them"*. But also, is recognised the need of generation of any relevant information regarding Tanzania's biodiversity to formulate strategic interventions for use and protection.

The sectoral policies encourage the use of instruments for resolving conflicts between wildlife protection and diverse economic activities, i.e. agriculture, as well as reducing the level of encroachment in areas like woodlands and forests (public lands), areas which demands compulsory law and suited administration. The ecotourism is a proposed strategy in the environmental policy, after the assessment of the environmental impact of such activity. The exploit and defence of wildlife resource is also aimed to benefit local communities.

The instruments included in the policy are:

- Environmental Impact Assessment: which includes to come across 'before hand' the impact a human intervention will have and to meet accord between all involved stakeholders, ensuring the harmony between natural process and inevitable human interference.

- Environmental legislation: required element to establish enforcement such as obligations, functions, and limitations for both private and public actors in Tanzania regarding interaction with natural resources.

- Economic instruments: a low cost mechanism that allows attaining some environmental objective while persuading and changing the way people behave. Some schemes are already in place in Tanzania.

- Environmental standards and indicators: signs established by the NEP to recognised the maximum values of the carrying capacity of ecosystem and their status. Their definition require the adoption of some sort of land use ratio i.e. agriculture/forest to establish relationships and formulate strategies to follow.

- Precautionary approach: refers to that if there is some indication of a cause-effect relationship, either the lack of complete understanding nor await for more substantial proofs should be a reason for not implementing a measure aimed to protect the Environment. This means that measures should never be late, though they can be not as precise as initially thought.

- International Cooperation: Taking into account that the Environment is a worldwide matter of concern, where every single man on the Earth has his contribution on it. The NEP addresses the need of some international frameworks to tackle those 'transboundary environmental problems', therefore Tanzania is on the way to increase support from abroad.

4.4.4. Wildlife policy

The Wildlife policy of Tanzania aims to protect the biological diversity of Tanzania. To do it, the policy encourages the identification, creation and upgrade of protected areas as well as the survey and acquisition of land title deeds for these areas.

The policy clarifies that the overall ownership of wildlife in Tanzania is on the State, however, it is established that the State will allocate rights to different stakeholders. Indigenous Tanzanians have the right of legal access to use wildlife. In general, the policy points out:

- The expansion of protected areas networks where necessary.

- The involvement of local communities in wildlife conservation.

- The necessity of making certain the capability of wildlife conservation to compete with other lands use.

- The inclusion of strategies to reduce wildlife-people conflict.

Something to highlight about the wildlife policy is the fact that it takes into account the interest of rural communities, especially those neighbouring protected areas, to raise wildlife conservation and management consistent with those interests; as long as rural communities stand the costs and implications of coexisting and protecting wildlife, they should also perceive the benefits of it (Shauri 1999).

4.4.5. National parks policy

The National Parks Policy (NPP) establishes the management and regulations to use national parks in Tanzania. The criteria for an area to be declared as a national park includes the national significance of the natural or cultural resources, the suitability and feasibility to be added and the need to be manage as a national park.

The NPP includes the provision of park planning in a regional context. It recognises that the success of the implementation of a national park relies on the activities carried out in the surrounding areas. And in the same way, activities inside the national park have an effect on the outside areas. Although this policy indicates that the national parks' authorities should work in cooperation with the local communities to avoid and resolve potential conflicts, it emphasises the disapproval of human settlement inside the park. The uses allowed inside any national park are recreational activities and authorized research. No hunting, agriculture, grazing, human settlements or any other consumptive use is allowed inside any national park in Tanzania.

Selected groups from local communities may be included as target groups to be provided with information and education needs. According to the policy, TANAPA should approach local communities as equal partners with shared benefits.

4.4.6. National land policy

In Tanzania all land is considered as public land with value and kept by the president for the general public. Since 1969 and under the Government Leasehold (Conversion of Right of Occupancy) Act, the Government of Tanzania has been issuing Rights of Occupancy. Those rights allow any citizen to dwell in and use a piece of land for an established period of time (no more than 99 years) and with development conditions enforced. Customary rights of occupancy are also recognised by this policy and they do not have term limited.

Under the NLP revocation of rights of occupancy might occur in case of public interest. But when it happens, it should include compensation in the base of cost-opportunity including market value, disturbance and transport allowance, lost of profits and cost of getting the land as well as incurred cost of development in the land in question.

The second edition of the NLP issued in 1997 includes the establishment of means for protection of sensitive areas such as national parks and it states that such areas are not subject of allocation to individuals. Unfortunately the registration of the statutory allocation of these areas does not take place causing in most of the cases encroachments and alienations. The policy also introduces the concept of the buffer areas between national parks and settlements as game controlled areas.

4.5. Pressures

The pressures here identified for the relation between the protected area and people with access and rights to land and land resources around Saadani ecosystem are: the establishment of SANAPA, the presence of villages in the border of the park and the increasing need of resources.

4.5.1. The establishment of SANAPA

In 1969 and after a demand for the villagers themselves, Saadani ecosystem was declared as a game reserve in an attempt to protect the wildlife, which was in serious threat due to permanent hunting. As declared in (Ally Hassan 2005) some verbal agreements were done between the then Wildlife Director and Saadani village elders, which consist of keeping on using natural resources, without farming or settlement for the part of the villagers, payment of some tourism revenue and preference for employment for the part of the administration of the game reserve for the villagers; things that according to the respondents did not happen.

TANAPA translated its intention of changing the level of protection of Saadani ecosystem in its non-public-released report: *Proposal on the Upgrading of Saadani Game Reserve and Zaraninge Forest Reserve into a National Park* in 1998. In it, TANAPA supports the upgrading of the level of protection of Saadani ecosystem from game reserve to national park as well as suggests an increment in the area to protect. Three arguments for that were (Ally Hassan 2005):

i- The then size of the protected area, 420 square kilometres, was not big enough for effective conservation,

ii- Others areas around were considered valuable to protect as well: wildlife use them during dry season, and

iii- The shape of the then protected area was not optimal for its purpose.

Booth (2000) in a report prepared on behalf of Saadani Conservation and Debelopment Program (SCDP), analised the options for el future status and use of SGR, a summary of the advantages and disadvantages of upgrading SGR into SANAPA can be found in Table 4-1.

Table 4-1: Advantages and disadvantages of upgrading SGR into a SANAPA

Advantages	***Disadvantages***
✓ Highest level of protection for the Saadani ecosystem. ✓ Inclusion as protected area of important zones: the mangrove swamps and Zaraninge Forest. ✓ Incorporation of marine environment into the protected area: breeding site for the green turtle.	× The new protection status will lead to a non-consumptive use of natural resources. × The Park's General Management Plan will control all private sector investment. × Land tenures conflicts with local communities and increment of TANAPA's operational costs are expected due to extension of park's boundaries.

Advantages	*Disadvantages*
✓ Extension of boundaries to include areas used by wildlife in dry season. ✓ Prohibition of any kind of hunting. ✓ Encouragement of tourism development outside the park. ✓ Arrangement and control of tourism development to avoid negative impact on the Saadani ecosystem. ✓ Strength of law enforcement.	× Local communities will get limited benefits and restrictions to access some cultural sites. × Saadani village will surround the park and TANAPA will have to coordinate its expansion. × High-likely conflictive relation between local communities and park authorities. × High operative and management cost related to a relative small national park.

Source: (Booth 2000)

4.5.2. Presence of human settlements within and near the park

The Saadani ecosystem is home to approximately 35,000 people (Table 4-2) mostly distributed in 10 main settlements (Figure 4-7) spread out around SANAPA (Tanzania National Parks and Department of Planning and Projects Development 2003).

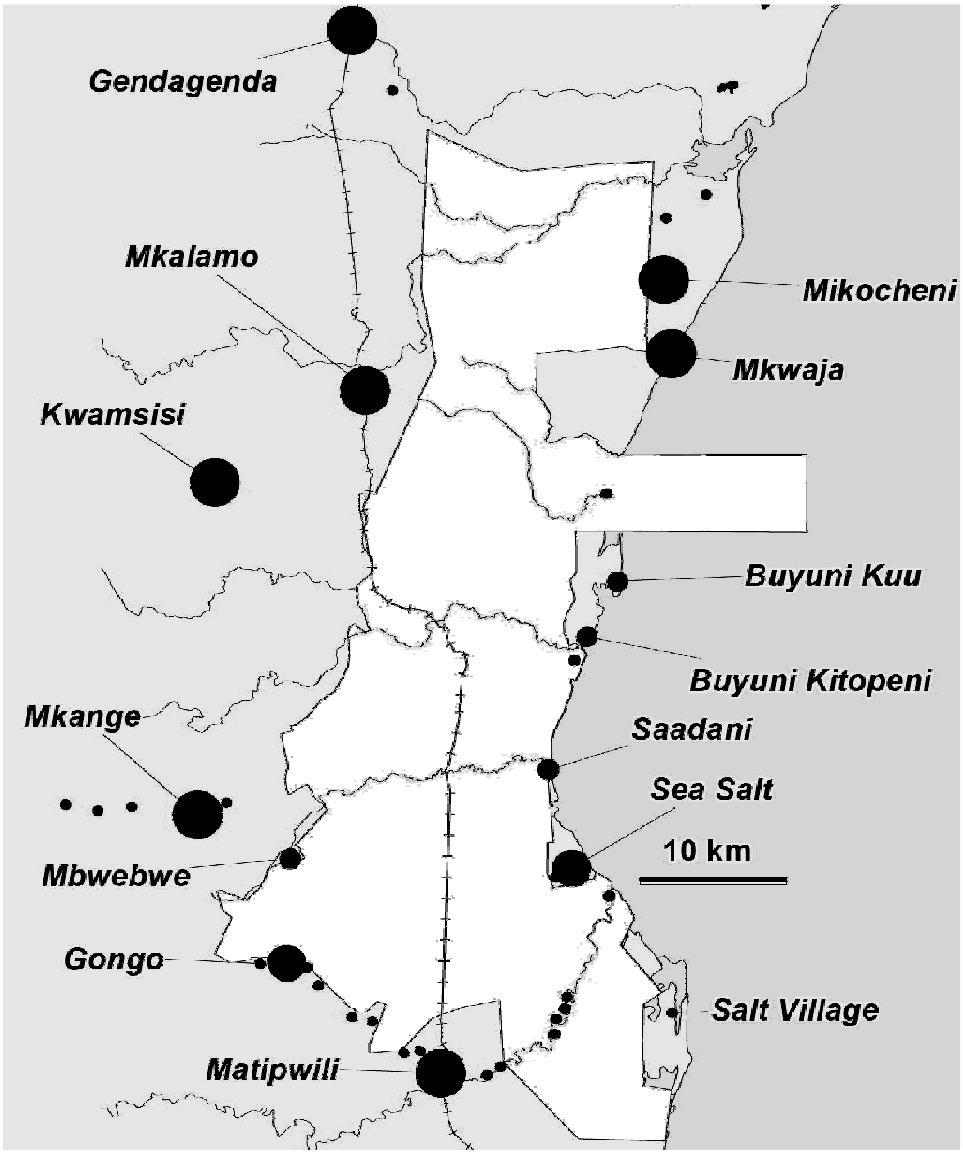
Table 4-2: Main villages surrounding SANAPA

District	*Village*	*Number of inhabitants*
Pangani	Genda Genda	2,500
	Mikocheni	1,500
	Mkwaja	2,000
	Buyuni (Kuu and Kitopeni)	2,00
Handeni	Mkalamo	3,000
	Mwamsisi	5,000
Bagamoyo	Mkange	3,200
	Saadani/Mbwebwe	800
	Gongo	1,000
	Matipwili	3,000
	Sea salt	500
Total		22,700

Source: Saadani National Park Management Zone Plan (2003)

Taking the average rate of population growth calculated from the results of the census of 2002 in Tanzania, 2.9% per year, and making an estimation of the current population in Saadani, the current population in Saadani would be close to 1,000 in 2009.

The villages and settlements in general, placed surrounding SANAPA have domestic economies dependant either of marine resources, crops or livestock keeping. According to the opinions collected from different villagers, local communities almost entirely rely on the use of natural resources of the region, which introduces a strong pressure in the system, leading to a threat for the protection and conservation of the entire ecosystem and conflicts with the community that use to have free access to those resources. Roettcher (2001) cited in (Ally Hassan 2005) already refers to it, illustrating the dependence of local communities on the protected area to obtain firewood, water, building materials and dwarf palm. For a summary on the collected data see Appendix B



Source: (Tanzania National Parks and Department of Planning and Projects Development 2003)

Figure 4-7: Location of settlements around SANAPA

4.6. State

The elements identified that describe the system's current condition are: uncertainty about boundaries, resettlements and increasing conflicts between SANAPA administration and local communities.

4.6.1. Boundaries' uncertainty

The area of Saadani ecosystem former declared as a game reserve and the area later incorporated as a part of the national park, were officially surveyed in 2002 with the approval of the village leaders. They took part in the recognition of boundaries, however, according to people interviewed, once the survey was carried out, it turned it out that surveyors changed the boundaries, leaving the feeling among the local community of have been losing considerable land of their villages. This is a source of permanent complaints from Saadani villagers worsened due to the availability of land for farming use and extraction of natural resources, Saadani villagers do not know where they can keep their livestock, which land they are allowed to use for their crops or where they can settle.

None of the villagers interviewed in Saadani, including the local leader, have ever been told about the boundary or even seen a map. They do not know for certain the boundary of SANAPA hence the boundary of their village neighbouring the park (Figure 3-2 and Figure 4-7): the SANAPA Tourism headquarter – which is inside the park's territory – is roughly less than 100 metres away from a first group of houses in Saadani Village group (Figure 4-8). Such proximity leaves no space for creation of buffer zones, as referred in the NLP, in order to keep distance and then mitigate potential tensions between these two conflicting land uses.

Figure 4-8: Photo of SANAPA, Saadani Village and wildlife life animals coexisting together

4.6.2. Resettlements

Eviction of all those living inside a national park is the next step once an area have been declared as such. In the case of SANAPA, that was not different at least partially. During the interview process in Saadani village, 5 families were found as have been shifted from their previous settlements inside the park. As they expressed, they were not the only ones: around 7 families more at the minimum, were forced to leave their crops, their houses and their lives and move to a new place. Of course, there was some compensation involved; nonetheless, they consider it unfair and unclear and as expressed by themselves: "they were never consulted either informed about the establishment of the park, they were just told to move" (see Appendix B).

The situation looks a little bit different, just a few kilometres away from Saadani village and inside the protected area under SANAPA: two small villages were found to be there. That is the case of Uvinje and Buyuni. In the case of Uvinje, as it own leader expressed, they were informed by TANAPA about the establishment of the park and as the previous case they were told to move away. However, in apparently contradiction, the district government in charge of the Bagamoyo district's council, allowed them to stay.

In Buyuni, the local leader expressed their ignorance about the establishment of the park before it happened. He and the whole community came to know about it, through a radio broadcast. And although they were told to move, as in all the previous cases, they decided to stay, even 'illegally'. Some other people were attracted to the area, to Saadani village particularly, with the purpose of getting some benefits from the expected tourism after the establishment of the park.

4.6.3. Increasing conflicts between SANAPA administration and local communities

The literature is full of texts analysing and discussing about different conflicts between wildlife and humankind around the world. In and around SANAPA, the situation is not different. According to the literature studied and the opinions collected on the field (see Appendix B), four types of conflicts can be identified in our system:

i. Crop damage: caused mainly by warthogs, bushpigs, yellow baboon, vervet monkeys and elephants. People used to cultivate maize, cassava, potatoes, coconuts but they cannot do it anymore for fear of losing their crops. Figure 4-9 shows some coconuts trees destroyed no long ago by elephants in Uvinje.

ii. Illegal use of natural resources: seeking for water, firewood and others natural resources to build their houses (Figure 4-10), and in general for their needs, women and children of Saadani Village are continuously entering inside the park. SANAPA rangers have caught many of them.

iii. Land availability: people living across the park have had to deal with the fact that 'their lands' now are protected areas, with no distinction of the rights they used to have, they cannot coexist anymore with the ecosystem conservations efforts.

iv. Pouching

Figure 4-9: Photo of coconuts trees destroyed by elephants next to Uvinje

Figure 4-10: Use of natural resources for building and firewood in Uvinje

Table 4-3 gives an overview of the most relevant problems in the park indicated by SANAPA administration in the Management Zone Plan:

Table 4-3: Main problems and issues in SANAPA faced by its administration

Conservation	*Use*	*Administration*
- Poaching - Water shortages - Wild fires - Green turtles threats - Lack of biological information - Extinctions of some species - Salt mining - Mineral prospecting in Kwamsisi - Problems animals - Coastal road alignment - Wami water alignment - Illegal fishing by commercial trawlers	- Tourism - Poor communications - Few tourism facilities - Delays in tourism permissions - Low wildlife numbers - Tourism "enclaves" - Poverty - Low level of understanding - Use restrictions on resources - Poor social services - Lack land for settlement and farming	- Villages resettlement - Inadequate, manpower equipment and facilities - Poor communications (roads) - Poor communications with villagers (esp. on boundaries) - Boundary not acceptable in some cases - Problem animals - Fall into three different districts

Source: Saadani National Park Management Zone Plan (2003)

4.7. Impact

The consequences of the changes in the system previously identified are increased limitation of livelihoods and a negative perception about TANAPA.

4.7.1. Increased limitation of livelihoods

As it was discussed in a previous section, Tanzania's economy is mostly based on agriculture which makes it highly dependent on natural resources. The economy of the area around Saadani ecosystem is quite limited: fishing, some types of crops and small livestock keeping. After gradual limitations (from open access land to game reserve and from this to national park) in the use and access of natural resources they exploit, their main 'supplier' has been restricted. Therefore their livelihoods have been limited as well.

People settled around Saadani claim that they have been living with natural resources from Saadani ecosystem since very long time ago, therefore they already have 'rights' over them, and their livelihoods depends on them. In the order of about 80 percent of the people interviewed in the area, affirmed their dependency on the resources of the protected area.

Two more issues to consider, apart from the establishment itself of the national park, are the boundaries uncertainty that causes people insecurity about the land they can or cannot use, the land they do or do not hold rights on it, and the changes in their life styles.

According to the information collected in the field (see Appendix B), the monthly incomes of the people in the community are between less than 50,000 Tsh (for 53% of respondents) and more than 100,000 Tsh (for a couple of villagers). Only one third on them (around 32% of the villagers interviewed), which are basically those who moved to Saadani looking for opportunities, reported an increase in their incomes associated with the establishment of the park, while most of them do not see any increment and a few of them, basically villagers resettled, associate SANAPA with a reduction of their incomes.

Another issue to consider also is the low generation of incomes through development of tourism in the park. Compared to other protected areas in Tanzania like Serengeti National Park, Kilimanjaro National Park or Ngorongoro Conservation Area, tourism rate in SANAPA is quite low. This was analysed before in 1997 by the Institute of Resource Assessment (Puppim de Oliveira) of the University of Dar es Salaam in a report requested by Wildlife Division. Booth (2000) citing that report, argues that given the infrastructure development at Saadani, the park's maximum carrying capacity is of 85 concurrent tourist. Among the constraints for tourism development listed, are poor and unreliable access to Saadani, limited quality of the beach, the existence of conflicts between the local community and the protected area administration and the potential conflicts between tourism and local interest.

Moreover, according to the available information for this study (see Appendix B), SANAPA administration has provided no mechanisms to guarantee that some of the revenue generated goes directly to community development projects.

4.7.2. Negative perception about TANAPA

According to what it was observed during the interviews (see Appendix B), SANAPA administration is not highly rated among most of the villagers both outside and inside the national park.

TANAPA charges $20 for each non-African citizen entering the park and local communities do not see the allocation of some revenues for the improvement of their communities. The lack of consultation and community involvement in decision making process leads people to distrust TANAPA; they associate its arrival to the area with:

- Enlarge provisions uncertainty.
- Augmented wildlife-human conflict.
- Rising community-park conflict.
- Reduced mobility.
- Restricted right to use natural resources.

Perceptions of local communities are explained in more detail in Chapter 5.

4.8. Responses

4.8.1. Implementation of community based conservation

Saadani Conservation and Development Program (SCDP), was established in 1998 as a project of the Ministry of Natural Resources and Tourism with the support of the Federal Republic of Germany. The object was to protect Saadani ecosystem through a sustainable use by governmental protective authorities, buffer-zone communities and other stakeholders (GTZ WPT 2005). The SCDP – ended before the establishment of SANAPA – was run with personnel of Wildlife Division, TANAPA, local administration and the German Agency for Technical Cooperation (GTZ), towards the reestablishment and reformation of the protected area.

In the villages around Saadani Ecosystem, the SCDP looked for getting in some means for building community based conservation. As it is described in (Ally Hassan 2005), the program succeed introducing some vehicles, building rehabilitation, better conditions for the administration staff of the area, and in general providing capacity building. However, it failed in the establishment of Wildlife Management Areas (WMA) because of the distrust of the villagers about the project and some organisational disagreement.

4.8.2. TANAPA's actions for the community

Despite their negative perception about TANAPA, villagers do recognise that some actions in favour of their community have been taken:

- Construction of school and teacher's house.
- Acquisition of dispensary supply.
- Support for construction of wells and water pumps.
- Education about human-wildlife coexistence in Saadani village.
- Provision of transportation in cases of emergency to the nearest hospital.

4.8.3. Saadani management plan

TANAPA sets up as part of the objectives of its management plan in SANAPA:

- To improve communications at the different levels.
- To demarcate boundaries clearly.
- To develop Community Conservation Service, this includes extension and benefits sharing. The activities include visits of TANAPA staff in SANAPA to local communities, negotiation and conservation education, provision of social services, among others.
- To support WMA.

- To facilitate a controlled and regulated access of local people to natural resources.

Additionally, the management plan of the park also points some activities to be implemented for the development of the park. Some of these activities are presented in Table 4-4.

Table 4-4: Responses proposed in the management plan of SANAPA

Issue	***Responses***
Poverty	- Develop a long-term programme to deal with poverty. - Establish a revolving fund for small groups - Educate and encourage local communities on ways to carry out cultural tourism - Collaborate with local communities in improving social services (schools, dispensary, water) - SANAPA tour operators should give local communities priority when employing staff - Areas for small businesses should be set aside near the entry points and tourist
Communications	- Improve the major roads in SANAPA to all-weather roads - Establish environmental committees in surrounding local communities
Outreach	- Provide environmental education and raise awareness on the importance of conservation
Problem Animals	- Assist villagers around the park to prepare local land use plans - Plant tree species that will play a role as a fence in blocking problem animals
Water Supply	- Assess water requirements both inside and outside the park.
Information	- Develop and implement an information management system
Boundaries	- Information to local communities about the boundary of the park - Demarcate the boundary clearly

Source: Saadani National Park Management Zone Plan (2003)

4.8.4. Recommendations

Local communities are of the opinion that TANAPA should encourage them through job generation, loans, investments, skill training, assistance in construction of houses with no natural resources from the park, establishment of the local hospital construction and inclusion in future decisions to take.

4.9. Indicators

"Indicators establish a relationship between an existing condition and an objective" (Petersen and Sandhövel 2001). The selection of an indicator suppose the definition of cause – effects relationships, extracted from the formulation of a framework in a way such that the information provided is clear enough to be used for decision making (Ojeda-Martínez, Giménez Casalduero et al. 2009). The DPSIR conceptual framework described in detailed in this chapter was established after the analysis of the data collected. The identification of the elements in each category allowed in turn the selection and definition of some indicators that would be useful to anticipate or to deal with conflicts between the establishments of protected areas and land rights.

Table 4-5 contains the list of indicators that correspond to the elements analysed. For each of the category, some variables were identified as an indicator to explain in a better way the complex factors included in the development of the framework.

Table 4-5: Indicators according to DPSIR framework of SANAPA and land rights holders

Indicator	***Description***
Driving Forces	
Population growth	Estimated percentage of the rate of population growth per year
Population density	Number of people settled around the protected area per square kilometre
Economic activities	Economic activities taking place around the protected area and which involve the use of natural resources
Economic instruments	Type of economic instruments provided in the environmental policy
Type of rights	Type of rights (Customary/ statutory) and its characteristics
Pressure	
Category of conservation	Type of the category of the protected area
Size of protected area	Area in square kilometres of the protected area
External population	Number of people neighbouring the protected area
Internal population	Number of people living inside the protected area
Minimum distance of settlements	Distance in kilometres from the protected area to the closest settlement
State	
Clarity about boundaries	Percentage of the population that recognises the boundaries of the protected area
	Existence of conflicting maps or boundary description
Participatory decision	Percentage of the population consulted about the decisions to make

Indicator	***Description***
making process	
Representativeness	Percentage of each sector or group of the community that took part in the decision process
Socialisation	Means used to inform the community about the decision and projects to carry out.
Compensation fairness	Rate of the compensation paid against the commercial value of each possession.
Compensation satisfaction	Percentage of the population that considers the compensation paid was fair.
Buffer zones	Area in square kilometres of the buffer zones around the protected area
Crop damage	Number of incidents reported regarding crop damaged by animals.
Land availability	Extension of land in kilometres available for the normal community development.
Impact	
Restriction of resources	Type of restriction imposed to local communities regarding the use of natural resources
Training in alternatives economic activities	Number of projects developed
	Percentage of local people involved
	Budget invested
Capacitating about wildlife-human coexistence	Number of projects developed
	Percentage of local community involved
	Budget invested
Responses	
Tourism benefits	Percentage of the revenues obtained from tourism allocated to projects in benefit of the community
Job generation	Number of local people hired for the administration of the protected area
Community development	Status of the main social facilities of the community (school, hospital)
	Budget in project to improve the status of the social facilities of community
Infrastructure development	Status of the infrastructure
	Budget in project to improve the status the infrastructure

4.10. Concluding remarks

Starting from the state identified in the 'system' established between SANAPA and local communities, in which issues like boundary uncertainty, resettlement and the existence of conflict between local communities and the administration of the national park, the developed DPSIR framework allowed to methodically derive the other categories. In this way, it was identified that local people struggles with an increasing limitation of livelihoods and have a negative perception of the administrative authority regarding the protected area. Such an impact in their lives came about from the pressure introduced by the establishment of SANAPA, which represented an upgrade in the level of protection as well as an expansion of the protected area. From the perspective of TANAPA, however, it was noticed that the remaining presence of human settlements inside the park causes a pressure over the implemented environmental measure of establishing the national park. Though some responses have been started by the administrative authority for the local people, from the point of view of the latter there are issues that are not addressed by TANAPA in dealing with the local communities' expectations. Those took place as recommended responses in the 'system'. At the highest level of DPSIR's categories, the driving forces of the 'system SANAPA-local people' were identified as concerning population dynamics and economic issues, on one hand, and the established policies regarding subjects that affect such implementation of environmental measure i.e., establishment of protected area. Finally, indicators were drawn to explain the different categories of the 'system', under DPSIR framework, which can be used to anticipate or deal with conflicts between the establishments of protected areas and land rights.

5. Analysis of the Perceptions of Saadani National Park's Stakeholders

5.1. Introduction

This chapter presents the perceptions analysis of SANAPA's stakeholders using DANA computer-based tool. Section 5.2 introduces the basic concepts of perception modelling, actors, factors and causal links and the analysis of perception graphs. This if followed by an example provided in Section 5.3, to explain the way to interpret the perception graphs and the results of the computation DANA performs. Then, in Section 5.4 the different categories of actors identified in the context of this research are presented with their perception graphs in Section 5.5. The results of the analysis of two instances of the model performed using DANA are included in Section 5.6 and finally, conclusions about the analysis carried out are presented in Section 5.7.

5.2. Some basic concepts in DANA

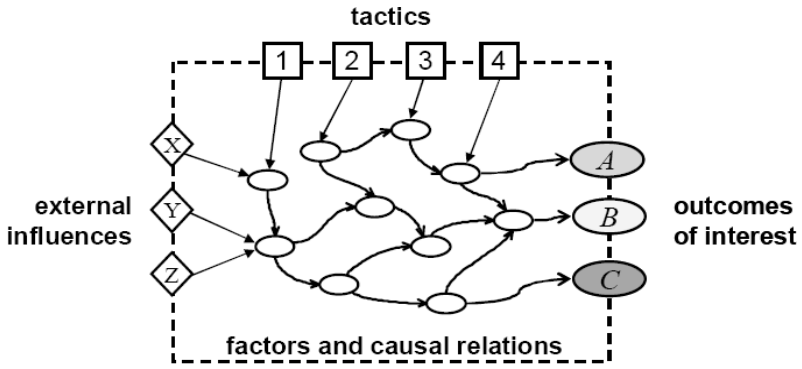
For a better understanding and analysis of the effect of the establishment of SANAPA on rights to land and land resources of local communities is worthy to look at the way all actors involved perceive this issue. In the context of this research DANA was drawn on to model such *perceptions*. This tool is developed on the basis that actors behave according to the assumptions they made about a circumstance; since many actors may have different assumptions o *perceptions*, disagreements may arise, causing in most of the cases conflicts. Therefore modelling actor's perceptions is a key that would enrich the conflicts' analysis capability.

5.2.1. Perception Modelling

Perceptions modelling is an approach defined by four dimensions, including: *Networks* as social ties between actors; *Perceptions* as the understanding an actor has about the issue he/she is involved in, about other actors and the relations between them; *Values* as the actor's impulse and preferences and last, *Resources* as the objects of attention and control of the different actors (Hermans and Thissen 2009).

An individual actor's perception model implies the representation of an actor's values, resources and perceptions; the analysis of this perception favours the distinction of supporting and opposing outcomes of interest, their precedence and prevalence (Bots 1999). However, as Bots also addresses, conflicts can only be identified when the analysis is performed not in a single perception model but in a set of them, all from the same issue. In this context, the issue object of analysis is the establishment of SANAPA and the effect it had on the rights people hold in the villages of Saadani, Uvinje and Buyuni in Tanzania. The component elements of this system were introduced and analysed in Chapter 4.

In DANA, an actor perception graph comprises a set of relevant aspects (factors), feasible actions (tactics), expected outside developments (external influences or prospects), and desirable goals (outcomes of interest), all linked up through a cause-effect relationship (Bots 2007). This is defined as a *Perception Graph* (Figure 5-1).



Source: (Bots 2007)

Figure 5-1: Components of an actor's perception graph

5.2.2. Actors

In DANA, actors represent different persons, organisations or in general groups that play a role in the issue analysed. Two groups of actors can be modelled in DANA: *Stakeholders* and *Agents*. Changes introduced by actors' actions or external influences can take place in the issue analysed; when these changes affect an actor's interest, such an actor in called a stakeholder, otherwise such actor is an agent (Bots 2004).

5.2.3. Factors and causal links

After the identification of actors, the next step is to establish the concepts and their causal links that according to each of those actors better describe the scenario of the issue analysed. The perceptions of each actor included in an analysis should consist of his factual (facts), causal (links) and teleological (goals) assumptions, according to Bots (1999). The first assumption refers to an affirmation expressed by the actors, concerning a relevant 'reality' of the issue analysed, e.g. *"boundaries of SANAPA are uncertain"* or *"customary rights of local people were left out"*.

In the contrary, teleological assumptions denote an actor's desire, something that a certain actor would like to come real, e.g. "*TANAPA should preferably invest more in community development"* or *"Villagers should definitely not go into the park to get natural resources from it"*. In accordance with Bots (2000), two things can be noticed from these examples. On one hand, the first expression supposes a desired event for a certain actor, while the second one, an unwelcome event; this, according to DANA's graphical language, is represented with an orange-coloured factor in the first case and a bluish for the second. On the other hand, expressions like preferably or definitely, used by the actors when expressing their desires, give some hints about the firmness of his assumptions. In DANA this can be observed in the intensity (from dark to light) of the colour in those factors.

Finally, causal assumptions, represented as an arrowed link between factors, express the cause-effect reasoning of an actor, e.g. "*if more land from Saadani village is included as protected area then*

villagers' main economic activities (crop growing, livestock keeping) will significantly decrease". Once again, the notion of degree and intensity was introduced to express what the actor believed is logic. A link with a ⊕ symbol represents an increment, while a ⊖ means a reducing effect, and the size of the ⊕ or ⊖, indicates the strength of the effect from expressions like severely, significantly or slightly. Therefore, including the link of no change, there is a total of 7 possible links⊕⊕⊕o⊖⊖⊖. Although this is a qualitative scale, DANA internally associates the size and the type of the link to quantitative values to perform the calculations.

5.2.4. Analysis of perception graphs

Two different types of analysis can be performed using DANA (Bots 2009): the first type is the analysis of a single perception graph to discover the potential changes brought by a particular actor and his adopted approach to achieve his goals. The second type is the comparison of perception graphs that facilitates the identification of the conflicts and their possible sources.

Taking into account that this research is aiming to discover and analyse the effects and possible conflicts that arose by the establishment of a national park in Tanzania, comparison of the perceptions of the different actors – second type of analysis – was performed, to get an overview of the possible conflicts between the actors.

The analysis of the perception graphs in DANA brings in two concepts: *Conflicts* and *Disagreements*. Bots (2009) describes conflicts as the differences in values experienced by two or more actors regarding how a factor should change or which action should be taken, hence there are two types of conflicts that can be analysed: goal conflicts and action conflicts. Disagreements are the differences of causal assumptions between actors.

The analysis in DANA also includes more outputs like: evaluation of an actor single strategy –action(s) that an actor performs to fulfil their goals –, evaluation of another actor's strategy, calculation of utility, satisfaction and frustration that an actor gets for his own goals and for other actor goals, among other outputs. DANA analysis output can provide a number of inferred variables that are computed based on the perception graphs and the modelling of factors changes, links and goals along with their ordinal scales.

To interpret the results DANA provides, the following should be taken into consideration:

- Calculations in DANA are performed using probabilistic functions based on quantitative scales of pre-established values given (automatically) to qualitative issues.

- In DANA, it is assumed that each actor looks for his best strategy: combination of factors that would make him to get the most out of his possibilities. In this sense, the software calculates the *utility*: 'feeling' an actor might experience when changes occur in his strategies or in other actor's strategies; *satisfaction* and *frustration* as the probabilities of success or fail an actor may 'experience' concerning the achievement of his goals. This analysis is called *Inferred strategies* in DANA. Figure 5-2 shows the scale of those 'feelings', ranging from -1 to 1, where -1 means a strong disapproval and 1 a strong appreciation.

Figure 5-2: Scale of possible disapproval/appreciation feelings experience by an actor

- In the cases where the analysis includes several actors' perception graph, is it interesting to look also at the *support* or *opposition* an actor may experience. Those concepts refer to the 'resulting feeling' (resulting utility) an actor may experience when the feeling of having performed his best strategy (own utility) is decreased by the feeling caused when other actor perform his best strategy as well (utility regarding that actor).

- For action conflicts and goal conflicts a figure is plotted. A dash-line represents absence of conflict while a thick line represents the presence of it. The thickness of the lines denotes the level of the conflict calculated by DANA.

- The figure plotted has a table associated showing the results of this calculation. The calculations performed by the software show results that may vary in a scale from 0 to 2 (software's settings), where 0 represents no conflict, or in other words that the actors whose perception graph are analysed, are in agreement about they way a factor should increase or decrease in the case of goal conflict, or about the way actions should be done in the case of action conflicts. Conversely, 2 represent a full disagreement.

5.3. An example of DANA modelling and anlaysis

The following example intends to depict the concepts introduced in the previous section to make understandable the results lately presented. The example is a somewhat based on the data collected. Figure 5-3 depicts the perception graph of actors A and B, generated in DANA to serve as an example.

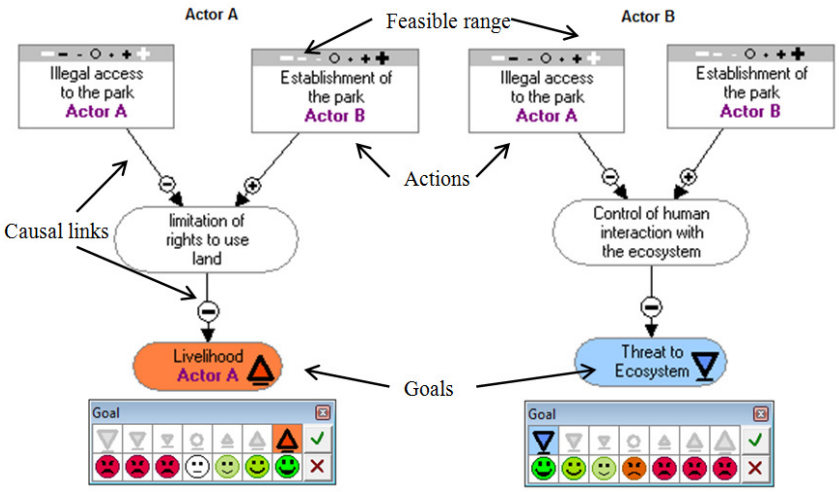


Figure 5-3: Perception graphs example

According to actor A and B's perceptions, two actions can take place in the system. Once is the "illegal access to the park" performed by *actor A*, and the second one is "establishment of the park" performed by *actor B*. In the feasible range of the actions (feasible changes to occur) for the "establishment of

SANAPA" only an increase of the park is considered as a possibility, thus the negative changes in the range are turned off (white-on-gray). For "illegal access to the park" is considered either to be reduced or to increase but just in a significantly way not dramatically, thus the highest negative and positive changes respectively in the range are turned off.

The perception graphs also show that there is a belief from the actor A's perception that the "limitation of rights to use land" brought by the "establishment of the park" negatively influences his "livelihood". From the actor B's perception a belief is that the "threat to ecosystem" is highly reduced by "control of human interaction with the ecosystem" which in turn is increased by "establishment of the park" and reduced by "the illegal access to the park".

Another concept that can be notice in the example is *Goals*. Actor B's goal is to reduce the "threat to ecosystem"; while for Actor A it is to increase his "livelihood". The 7-point utility scale shown in Figure 5-2 is also used to express how actors A and B experience a level of change. In Figure 5-4, it is shown the result of the inferred strategies for this example. The table shows the ideal and worst inferred strategies, which are obviously the ones that lead to highest and slowest possible utility values for an actor (in a range of -1 to 1).

In the example, taking the perception of Actor A, the best possible strategy in the model is to occur the action of the park as it is, (notice that an reduction was not a feasible change to occur) and to increase considerably the illegal access to the park, as they belief that this reduces their limitation of right to use land, which in turn has a negative impact in their livelihood (his goal). Now considering the perspective of Actor B, the worst strategy is somewhat the same as the ideal one for Actor B: to have an increase in illegal access to the park. This comes from the belief of Actor B that illegal access to the park reduces the control of human interaction with the ecosystem, which is a factor that should reduce the threat to the ecosystem (his goal). Thus, as much as illegal access occurs would have a negative influence in Actor B's goal of reducing the threat to ecosystem.

The variables satisfaction and frustration in Figure 5-4 carry similar intuition than the terms themselves: represent the chance of the actor having a positive or negative utility value, respectively, what can easily be associated to whether the actor is satisfied or frustrated with a certain tactic. In the rather small example show in Figure 5-3 of modelling perceptions in DANA, it can be noticed that the best strategy of TANAPA lead it to experience complete satisfaction, while for villagers only a moderate satisfaction was experienced (Figure 5-4).

Actor A→	*Actor A*		*Actor B*	
Factors	Ideal	Worst	Ideal	Worst
Establishment of the park *[Actor B]*	2 (+12)	1 2 (+12)	1 (+3)	1 (+2)
Illegal access to the park *[Actor A]*	1 (+12)	1 2 (+12)	1 (+3)	1 (+2)
Utility	0.50	-1	1	-1
Satisfaction	50%	0%	100%	0%
Frustration	0%	100%	0%	100%

Figure 5-4: Inferred strategies example

DANA also provides an output on what is the emotion experienced by the other actor, once the best strategy of one actor is performed (Figure 5-5). From this output, it is clear that Actor B experiences completely opposite (-1 and 1) feelings depending on whether his or Actor A' strategy is taken, while for Actor A there is none possible strategy to let them completely satisfied (0.5 and -1, he does not experience 1). This means that Actor B stands to lose more (higher range in utilities) in this case (1 – (-1) = 2 against 0.5 – (-1) = 1.5).

Actor A→	*Actor A*			*Actor B*		
Actor B↓	μ Utility	% Satisfaction	% Frustration	μ Utility	% Satisfaction	% Frustration
Actor A	0.50	50%	0%	-1	0%	100%
Actor B	-1	0%	100%	1	100%	0%

Figure 5-5: Support and opposition example

Conflicts between the actions (and also between goals, when it happens that the same goal is presented in both perceptions) that can be taken accordingly to each actor are also inferred by DANA from the perception graphs (Figure 5-6). From the output of the example, one can say that there is some level of conflict between the actions that should be taken according to Actor A and actor B. In the example, for instance, it can be noticed that there is the belief of Actor A that the establishment of the park eventually influences negatively their livelihood, which they have interest in increasing. Thus there is clearly conflict about the action that should be taken in this context.

Actor A→	*Actor A*		*Actor B*	
Actor B↓	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict
Actor A	0	0	0	1.1
Actor B	0	1.1	0	0

Figure 5-6: Conflict example

A number of other outputs are possible to be given by DANA. But this research focused on the analysis of the outputs that were here discussed.

5.4. Identifying actors to be included in the analysis in DANA

Similar to the management of protected areas around the world, particularly national parks– as it was presented in Chapter 2 – the establishment of SANAPA involved a conflicting relation between several actors, mainly its administration and the surrounding local communities, condition that imposes a challenging management to ensure the prevalence of the protection of the Ecosystem.

The actors indentified – according to the information collected during fieldwork and the interpretation given to it – and included in the analysis carried out in this research of the perceptions in the issue of the establishment of SANAPA and its effect in local people rights, are:

- TANAPA

- Villagers from Saadani.
- Villagers living inside the park.
- Villagers resettled.
- Villagers that moved to Saadani village looking for opportunities brought by the park.

TANAPA is a parastatal agency constituted since 1959 in the Tanganyika (former name for Tanzania mainland) National Parks Ordinance Cap. 412, which is in charge of the protection and administration of the national parks in Tanzania. TANAPA is one of the relevant and influential actors in the cause-effect relation between SANAPA and local communities.

Villagers are undoubtedly the other relevant actors, in the issue here analysed. Together with TANAPA, they form the group of stakeholders that have interests and weight, and are influenced as well by the system of the establishment of protected areas and land rights. Their major complaint is that their traditionally access to land and land resources have being affected with the establishment of SANAPA, and little or nothing has been done to compensate them. Due to the diversity of circumstances and effects caused, and according to the data collected, this stakeholder was divided into four categories that were modelled and analysed.

- The first category corresponds to the group of actors that were living in Saadani, even before the establishment of SGR. They express they have been facing a gradual limitation in their rights and the area of their village (see Appendix B)
- A second category is formed by the people that were living and continue living inside the park after its establishment, despite what is envisaged in the legislation with regards to national parks in Tanzania.
- The third category is constitute by the group of villagers that contrary to the second category, were told to move out of SANAPA after receiving an unfair and unexplained compensation, as expressed by them (see Appendix B). Their 'views' are represented in this category.
- And last but not least, a fourth category was analysed, that includes those people that spontaneously moved to Saadani village in search of opportunities that the park would bring,

Other actors, so-called agents according to DANA's terminology, who were identified as having influence in the system yet do not have a stake in it, were not included in the analysis to keep the model simple as well as improving the performance of the software whose processing time can increase exponentially according to the complexity of the perception graphs. Such agents are:

- The President of Tanzania. As such, he is responsible for declaration of any protected area as a national park or game reserve, after approval of the Parliament and he also can modify the boundaries of a national park.

- Ministry of Tourism and Natural Resources. It is in charge of management of natural resources and development and evaluation of policies as well as enforces the respective legislation. It heads TANAPA.

- The Tanzanian Wildlife Division. It is one of the four divisions under the MTNR. Apart from managing the reserves and game controlled areas throughout the country, it has official command to manage wildlife outside national parks.

- District local government. According to the legislation (Act No. 7 of 1982) local government overlooks the execution of plan, programs and projects within the area of jurisdiction, as well as supports for protection of the Environment and benefit of communities.

All these actors are linked up together creating a network, Figure 5-7 shows the assumed relations between the identified actors in the establishment of SANAPA.

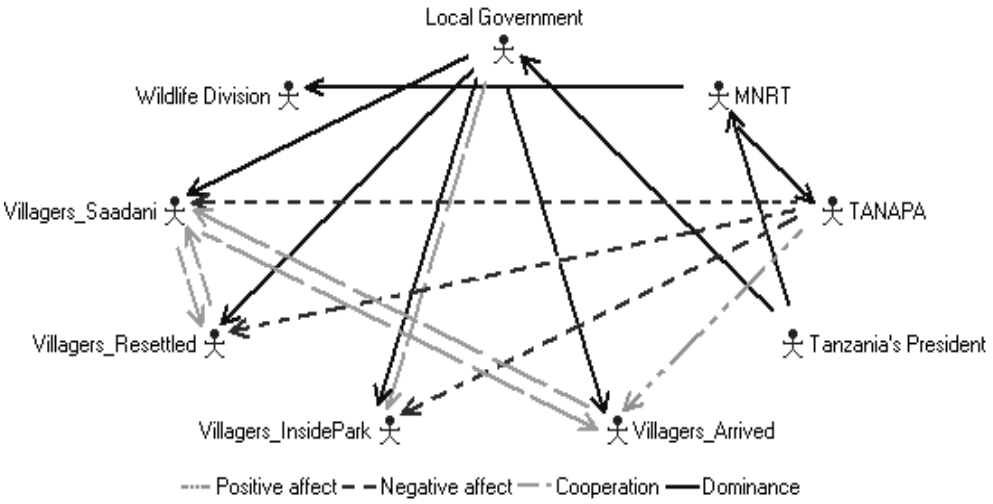


Figure 5-7: Actor relations in the establishment of SANAPA

As it can be noticed, villagers from Saadani, villagers resettled and villagers living inside the park consider they have been negatively affected by SANAPA, on the contrary those villagers that arrived consider what TANAPA has done has been positive for them. The graph also shows the assumed relation of cooperation between villagers resettled and villagers from Saadani, and those with villagers that arrived to Saadani. This is because they share the restrictions and the benefits, when the case, as well. Another relation depicted is the strong influence from the President to the MNRT and the local government; from the MNRT to TANAPA and from local government to different villagers.

5.5. Modeling stakeholders' perception in DANA

The perceptions of the different villagers introduced in the previous section were developed based on the data obtained in the interviews carried out in the field as well as direct observation (see Appendix A for questionnaires and Appendix B for a summary of the data gathered). Regarding TANAPA, its perception was constructed on the basis of secondary data. The perceptions here depicted are assumed

to be the stakeholders own perception. Though in fact, they are the analyst interpretation of those views as encountered in the field and secondary data.

5.5.1. Perceptions of TANAPA

In the perception graph of TANAPA (Figure 5-8), four goals can be identified. The first one is *Maintenance of flora and fauna of SANAPA safe from conflicting interests of a growing population*, a factor that according to the role of the organization should definitely increase greatly. This goal is deeply influenced by the TANAPA's *Organization and management of SANAPA* itself and by the local communities' *Illegal access to SANAPA*. But to keep Saadani's Ecosystem safe means to increase the *Limitation to rights to use land and land resources from local communities* which together with the issue of *Boundaries of protected areas* increase *Nonconformist behaviour* from local communities thus increasing as well *Conflicts* with local communities, a factor that TANAPA would like to reduce significantly.

TANAPA recognizes that villagers from Saadani, promoted the protection of wildlife, action that later implied the *Declaration of Saadani Game Reserve* by the president and the adjudication of the *Management and protection of SGR* to Wildlife Division. That brought the *Implementation of the SCDP* and with it a slightly increase in *Community Development*, another goal of this organization. The community development is increased by a sequence of factors starting with the *Organization and management of SANAPA* by TANAPA, which leads to an increment of *Investment in community projects* and finally the *Community Conservation Service* with a positive effect in the mentioned goal. The investment done by TANAPA has mainly led to increments in *Infrastructure*, *Improvement of public facilities* and *Training* of local communities to live with wildlife.

The fourth goal in this TANAPA's perception graph is *Preservation of Natural Heritage*, which according to the mission statement of this organization, should definitely increase greatly through *Wildlife Conservation*, the objective of the latest *Declaration of SANAPA* by the President and the former declaration of the SGR. However, when people from local communities illegally enter the park, the effort to conserve wildlife are reduced, and considering the relevance of this ecosystem, the technical division of TANAPA raised the issue to *Propose of updating SGR into SANAPA* to enlarge the *Level of Protection of Saadani Ecosystem* under the strategy of *Expansion of protected areas* suggested in the *Wildlife Policy* promulgated by the MNRT.

But there are not only negative effects for the villagers, according to SANAPA administration's view. The establishment of the park had brought some *Tourism in the area* which positively affects *Villager's Profits* in a significant way.

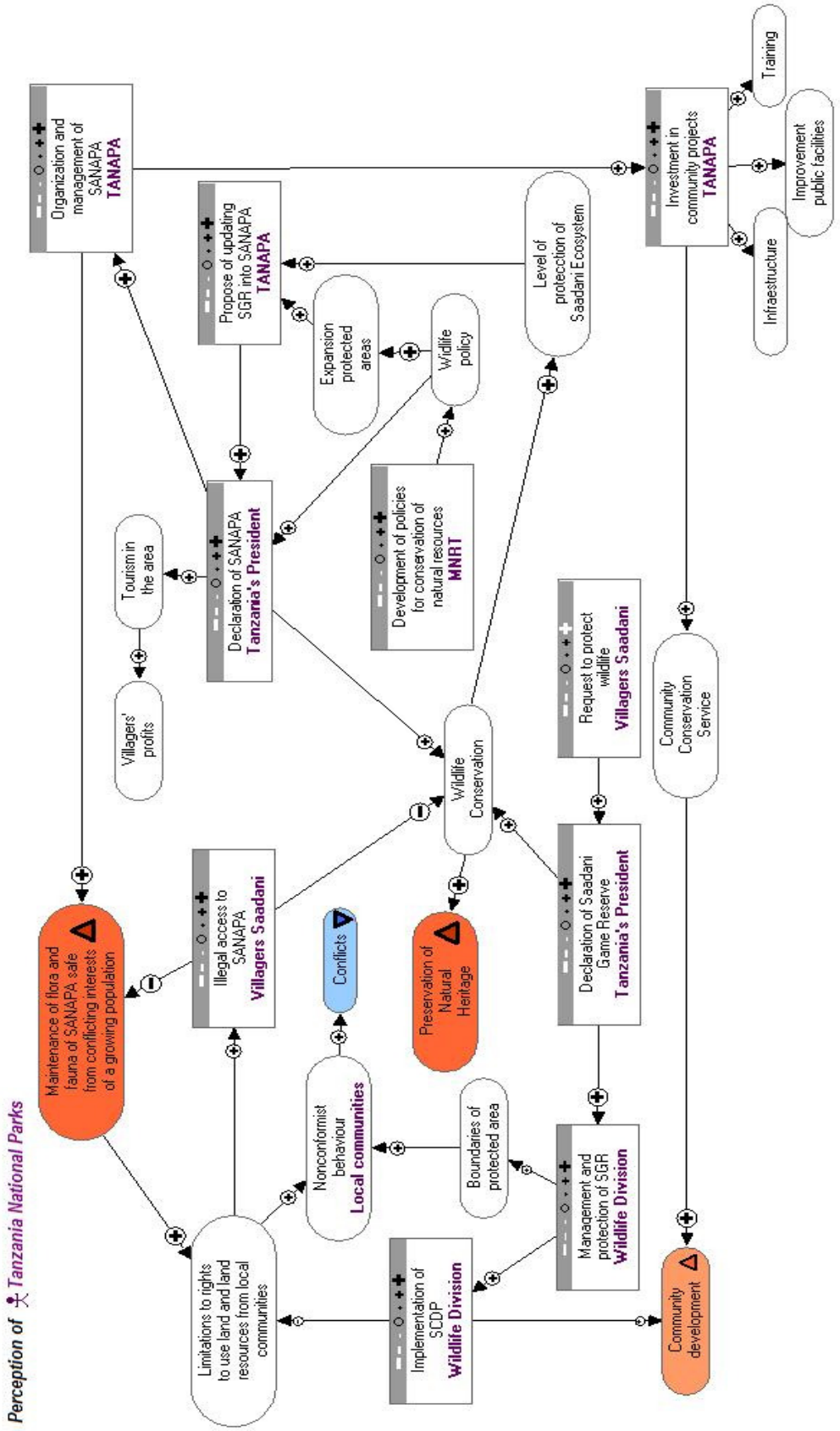


Figure 5-8: Perception graph of TANAPA

5.5.2. Perceptions of Saadani Villagers

Saadani villagers' perception is shown in Figure 5-9. On it, it can be seen that the *Establishment of SANAPA* by TANAPA is believed to severely increase, on first place, the *Level of protection of Saadani Ecosystem* and with it, the *Restrictions to access the resources inside SANAPA*. And secondly, the *Protected Area* resulting in a great reduction of *Village Land,* which together with the *Park/village boundary uncertainty*, very much increased by SANAPA as well, has a large effect in the *Village main economic activities*.

The economic activities in Saadani affect two out of five goals of its villagers: *Incomes* which is a factor that Saadani villagers want to be increased, and *Livelihoods*, which they do not want to see decreasing. Their incomes are strongly associated with their livelihoods and to a very low extend associated with a positive effect of the park in *Employment from TANAPA* and *Tourism in the area*. Saadani villagers do believe that *Revenues* from TANAPA has been significantly increased by the tourism, however, the *Investment* of TANAPA *in community projects* is low although *Training*, *Improvement of public facilities* and *Infrastructure* have resulted from it, and all together in *Community Development*, another factor wanted to be increased.

Saadani villagers frankly recognize their Illegal access to SANAPA, caused by the restrictions imposed after the establishment of the park, as the only way to *Use of land and land resources needed*, once their *Traditional rights to land and land resources* have been greatly reduced. This is another factor that should not increase, according to them, because all this is a sequence of factor ultimately affecting their livelihoods.

Saadani villagers also expressed their awareness about the negative effects of their illegal access to the park regarding *Wildlife Conservation*, although they consider their entrance to the park, minimal and not harming for *Preservation of natural Heritage*. This is an issue significantly supported by them. They want to protect their natural legacy, a proof of that is their own *Request to protect wildlife* that was in threat by excessive hunting, as expressed by them.

Lastly, *Land tenure insecurity* is another factors included by the villagers and that they would like to see it reduced because of the negative repercussions in their daily life, this issue brings. They believe that due to the uncertainty in boundaries this issue has dramatically increased in their village.

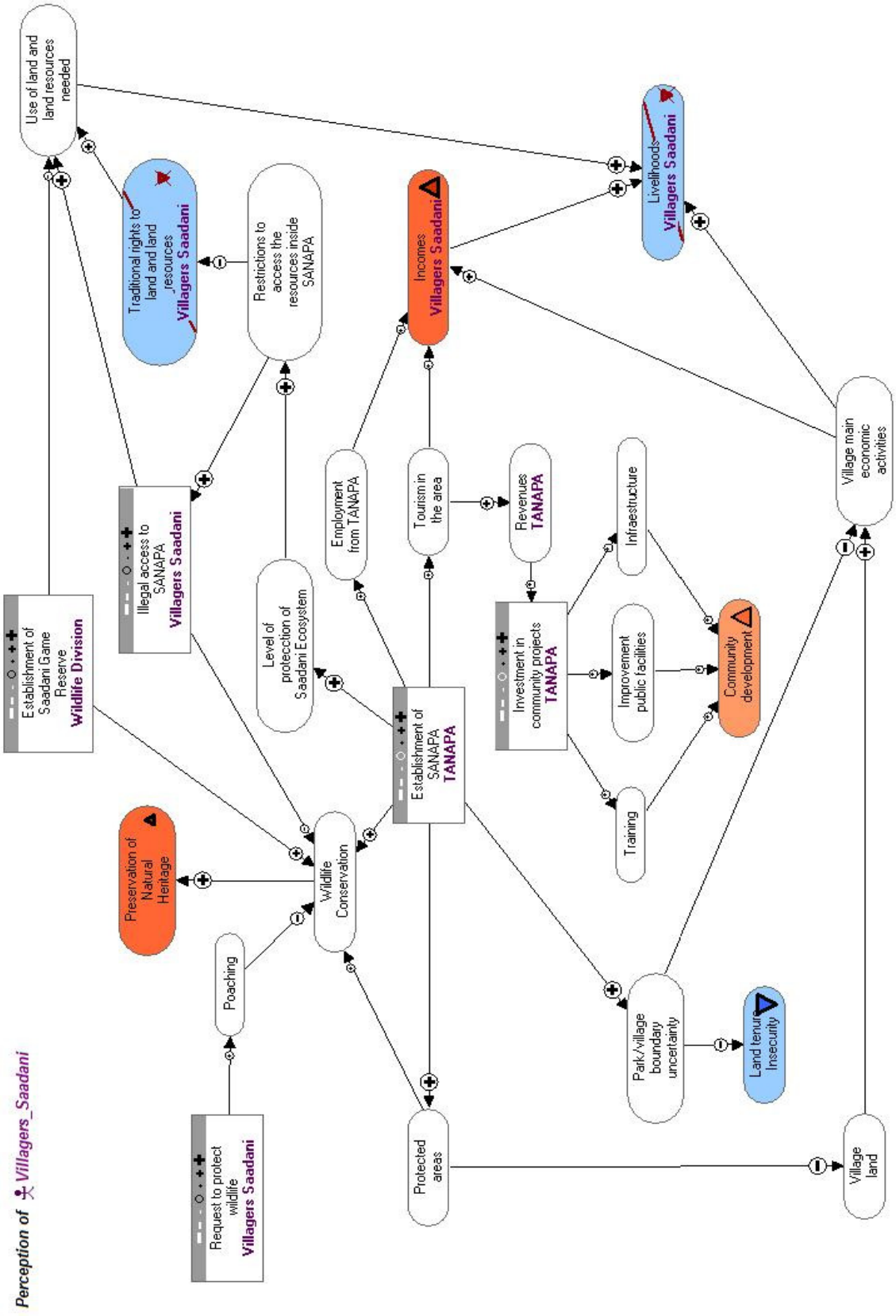


Figure 5-9: Perception graph of Saadani Villagers

5.5.3. Perception of the Villagers living inside the park

Another actor included in the analysis of the effect of the establishment of SANAPA in rights of local people, is villagers living inside the park. Figure 5-10 depicts its perception. As in the previous case, the central issue of the graph is the TANAPA's act of *Establishment of SANAPA*. According to these villagers, this action is believed in first place to have a great amplified effect in the *Extinction of their rights*, in the creation of *Protected Areas* and the *Level of protection of Saadani Ecosystem*. A significantly increment of the *Revenues of TANAPA* and slightly increment of *Tourism in the area* and *Employment from TANAPA* are other factors associated with such an action.

Since having ended to be inside of a protected area, for them the rights extinction that SANAPA supposes, increases their *Risk of eviction* in sequence ended in an expected reduction of *Land tenure Insecurity* for them. Despite this, *Wildlife Conservation* is positively associated with the size of the protected area by these villagers. They do consider it as a key issue to *Preserve Natural Heritage*, a factor that as well as for villagers from Saadani, should increase even in a small proportion. However, they also associate *Wildlife conservation* with the former SGR established by Wildlife Division with the additional benefits that it brought *Support* to reduce *Crop destruction* when it arose, making *Wildlife conflicts* increase. But that were benefits they had when they were in a protected area in which they could stay, and this is not the case anymore after SANAPA and the legislation regarding national parks in Tanzania.

Regardless of an assumed light tourism in the area, villagers living inside the park associate that issue with a small increment in their *Incomes* and a significant increment in TANAPA's revenues, which in turn has increased the *Investment in community projects* from TANAPA, specifically improvement of *Infrastructure* which helps in their *Community development*, another factor that should increase for everybody's own well.

Their livelihoods are believed to be positively affected by some employment generated for the operation the park and their *Village main economic activities*, which take place as long as they have *Area to cultivate and livestock keeping*, among others.

Two sensible and very important goals for villagers living inside the park are directly influenced by the increased *Level of protection of Saadani Ecosystem* due to the establishment of SANAPA. On one hand, the upgrading in the level of protection caused dramatic *Changes in rights to land and land resources*, changes they want not to increase. However, despite their desires, those changes suppose the *Eradication of rights outside the boundaries of their village*, which forced them when 'needed', to *Illegal access to SANAPA*. Additionally, they take no notice of any corresponding legislation, believing there is *Conservation of rights inside the boundaries of their village*. Thus, the area to carry out their main economic activities is negatively affected by the eradication of their rights outside their village boundaries, which they claim to know very well; but because they consider their village land, their basic economic activities can take place.

On the other hand, the level of protection of Saadani Ecosystem is believed to dramatically decrease their *Livelihoods*. As been another of their goals, and as it can be inferred, these villagers do not want their livelihoods to decrease.

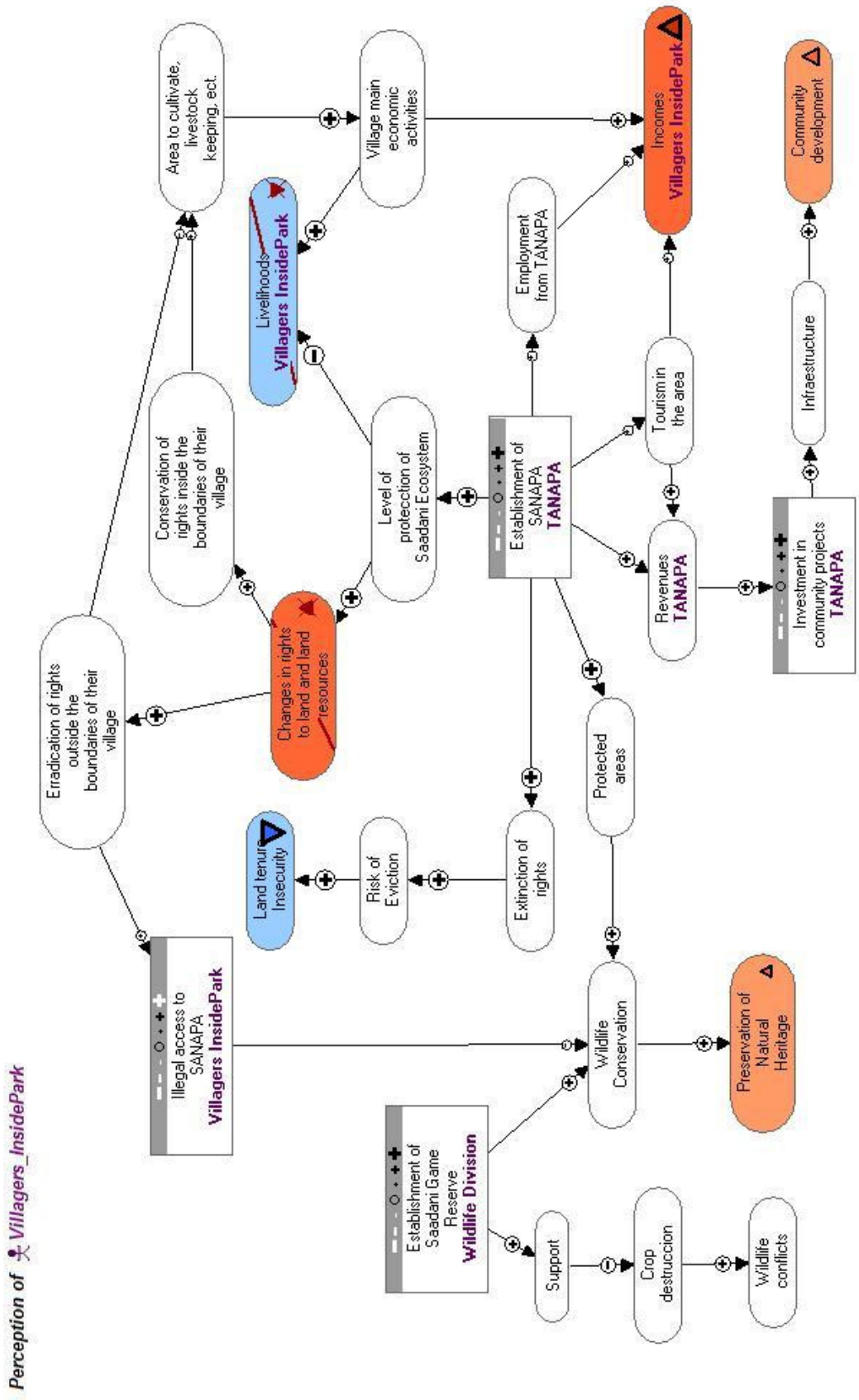


Figure 5-10: Perception graph of villagers living inside the park

5.5.4. Perceptions of the Villagers resettled

Figure 5-11 shows the perception of the most probably affected villagers neighbouring SANAPA: those villagers that were living in an area that was declared protected, but unlike the previous actor analysed, they were not allowed to stay there and were forced to settle somewhere else. Some of them, trying to be as close as possible of their original place of residence, settled in Saadani village.

Starting with the key issue of this research, the *Establishment of SANAPA*, villagers resettled think this event is the impulse of a group of events including, the increment in a very big proportion of *Protected Areas* in the region, followed by *Wildlife Conservation*, *Level of protection of Saadani Ecosystem* and *TANAPA's Revenues* and finally minor *Employment from TANAPA* and *Tourism in the Area*.

Similar perception of the villagers living inside the park, share the villagers that were resettled after the establishment of SANAPA regarding the factors of employment and tourism. For them, these factors are slightly increased by SANAPA, but at the same time they cause another factor, specifically a goal, to increase in a small proportion as well: their *Incomes*.

As expressed by other villagers, those resettled consider that TANAPA significantly increases their *Revenues* with SANAPA; however, they do not see the investment of this organization in the development of the communities around the park.

It is assumed that the increment in the level of the protection of Saadani Ecosystem combined with the increase in protected areas, lead to the current status of their *Traditional rights* are *extinguished*. They argue that once their rights were not recognized anymore, an *Eviction* process with an *Unfair compensation* came. The eviction obliged them to move and resettle, while the compensation received contributed to their *Impoverishment*. Both *Resettlements* and *Impoverishment* are factors that villagers consider should decrease considerably. The effect of resettlement in is related with a *Negative change in people's life* factor, when they left everything behind they faced *Loss of crops and houses*. Their *Incomes* and their *Livelihoods* in general were terribly affected, as it can be noticed in the diagram, these two factors are expressed being goals for these villagers: the first one is expected to increase while the second one not to decrease.

Another factor considered relevant for these villagers is the *Access and use of land and land resources of the community*; their livelihoods depend on it. That is why after losing their rights, they exercise an *Illegal access to SANAPA* to get the resources they need for building, firewood and more. But when they were asked about the impact of this action in *Wildlife Conservation*, they recognized a very small impact arguing that they have been living with wildlife all their lives and they have never threatened it, but on the contrary looking for *Preservation of Natural Heritage*. Finally, they also recognized that both the increment of protected areas and wildlife conservation brought by SANAPA aid the wildlife and protection of the ecosystem, although they do not agree with the methods used for it.

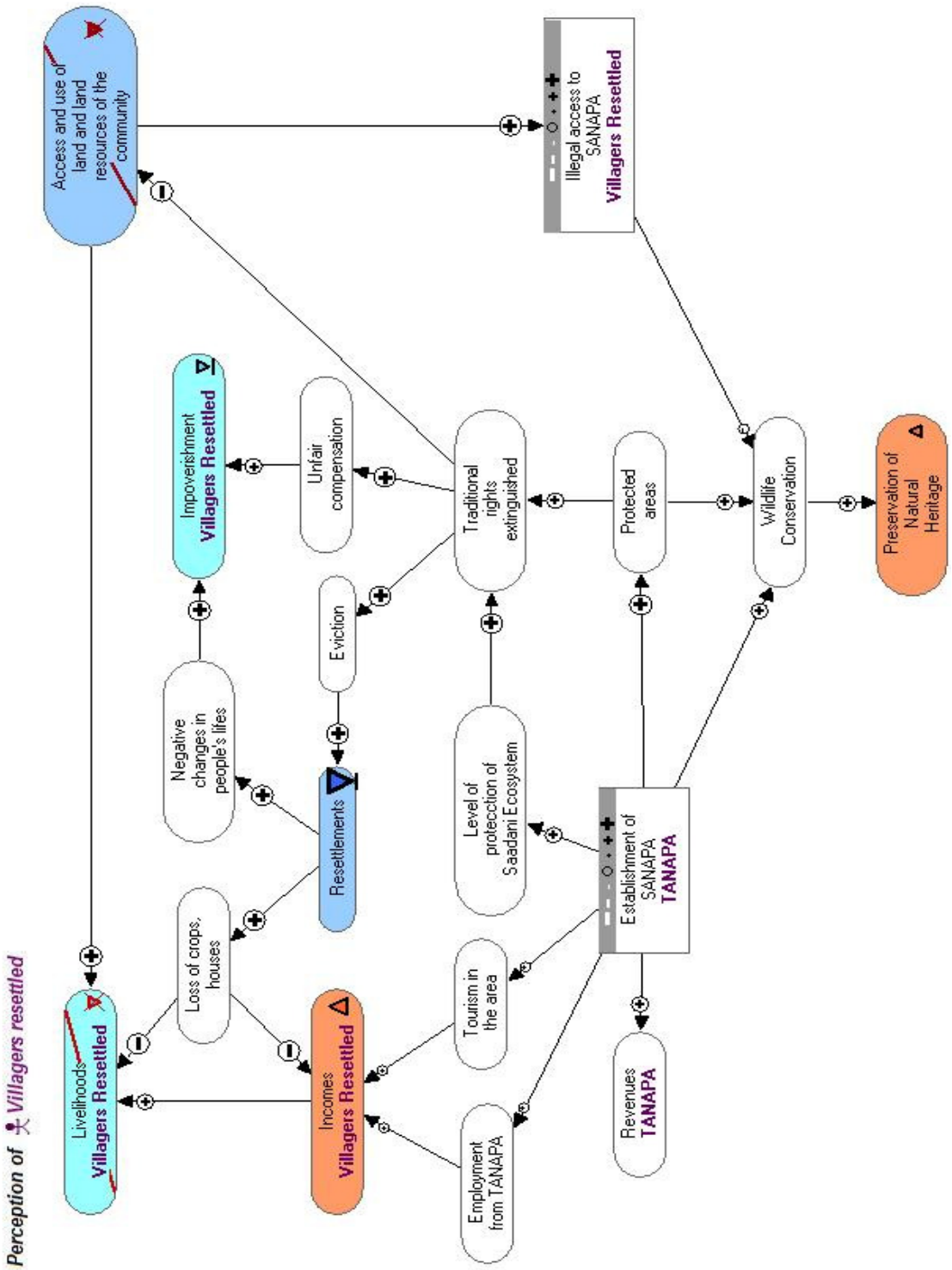


Figure 5-11: Perception graph of villagers resettled

5.5.5. Perceptions of the Villagers that moved to Saadani looking for opportunities

The last stakeholder analysed in this study, is the group of villagers that moved out from their villages and went to Saadani after they learned about the establishment of the park. Figure 5-12 shows the perception graph of this stakeholder.

They see the *Establishment of SANAPA* as an act that in first place, increases *Wildlife Conservation* and with it *Preservation of Natural Heritage*, an issue that all villagers seem to support. There is another identified factor: TANAPA's *Revenues*, which once again is believed to increase the *Investment in community projects* from TANAPA with *Improvement of public facilities* and *Infrastructure*, two issues that have significantly contributed to *Community Development*, another focus of interest for these villagers.

But the one that really encouraged them was the chance for *Opportunities* from the park itself, from *Employment from TANAPA*, but also from the *Tourism in the area*, they *Voluntary moved to Saadani* in an attempt to improve their economical condition and increase their *Incomes*.

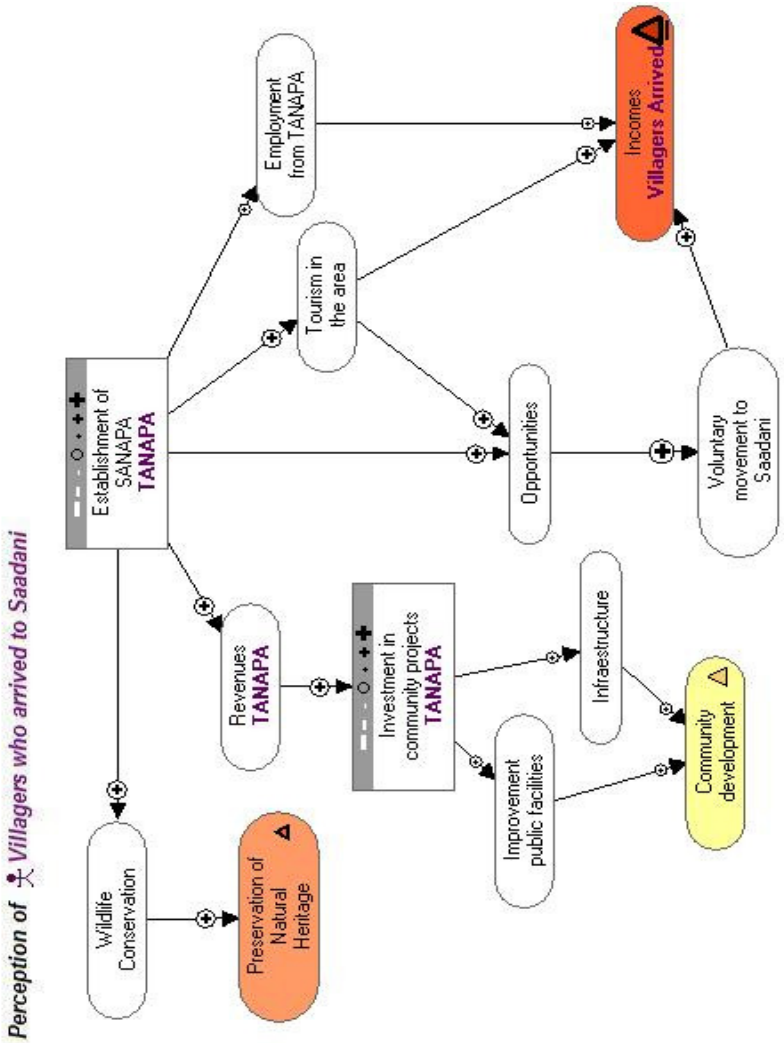


Figure 5-12: Perception graph of villagers who moved to Saadani

5.6. Analysing stakeholders'perceptions using DANA

A first attempt of computing the analysis in DANA for the perception graphs introduced in the previous section, turned out to be too complex for the software to perform. Thus the complexity model had to be selectively lowered. Consequently two cases were analysed: (1) one that includes only two actors, TANAPA and Local villagers, bringing the most relevant issues of the four types of villagers into a single actor (for details of the perception graphs used refer to Appendix C); and (2) one that includes TANAPA and the four types of villagers, but with rather simplified perception graph for each stakeholder (for details of the perception graphs used, refer to Appendix D). An advantage of this is that comparison of the two outputs will allow the validation of the models constructed.

5.6.1. Analysis Case 1: TANAPA and an integrated perception of local villagers

From Figure 5-13, it can be observed that TANAPA and local communities' goals do not conflict with each other, but their actions. These two actors do not experience contradictions in goals because in cases where both have associated a goal to the same factor, they do not contradict each other in the preference of change, e.g. mostly all villagers and TANAPA consider *Community Development* and *Preservation and Natural Heritage* factors that should increase, not to decrease. They may not agree on 'how much' they want those factors to increase, but they do agree in the direction of the change: positive. The dashed-line in Figure 5-13 represents the 0 value in Figure 5-14.

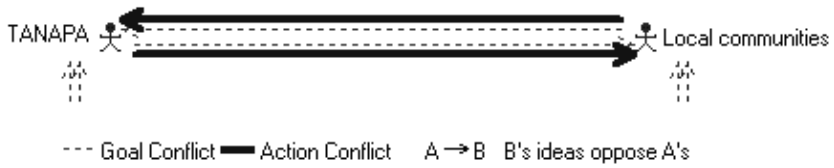


Figure 5-13: Goal and action conflict relation between actors – Analysis 1

According to the computation performed by DANA, these actors disagree somehow about the actions that should be taken (thick line in Figure 5-13). The results show a value of 0.64 of opposition (see Figure 5-14), in other words, local communities disagree with the way actions should be taken according to TANAPA and in the other way around. Placing this result in terms of factors already discussed: we obtain that local communities experience dissatisfaction due to the extinguishment of their traditional rights imposed by the establishment of SANAPA, as well TANAPA experiences it when local communities illegally access the park.

Actor A→	*Local communities*		*TANAPA*	
Actor B↓	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict
Local communities	0	0	0	0.64
TANAPA	0	0.64	0	0

Figure 5-14: Computation of goal conflict and action conflict – Analysis 1

According the perspective of local communities, the inferred ideal strategy by DANA for this actor is to *not introduces changes in SANAPA* after its establishment, like new boundaries or increment in area, combined with a increase on the levels of *illegal entry to the park* and considerably more *investments in community projects*, bringing a satisfaction of 42% and frustration of 33%, which means that given that conditions they would significantly approve it (see Figure 5-15). In opposition to it, the worst inferred strategy for local communities includes no changes of any kind in the three tactics, condition that has their great disapproval giving them a frustration of 83% with no satisfaction.

In the case of SANAPA their ideal or preferred strategy would be to introduce some slights changes in the *establishment of SANAPA* plus no increments in the *illegal entry to the park* and keep *investing in community projects*, obtaining a satisfaction of 67% and a frustration of 33% (see Figure 5-15). On the other hand, this organization gets a frustration of 75% with no satisfaction when the illegal access to the park increases and the investment in community projects reduces.

Actor A→	*Local communities*		*TANAPA*	
Factors	Ideal	Worst	Ideal	Worst
Establishment of SANAPA *[TANAPA]*		1 (+20)	1 (+2)	
Illegal entry to the park *[Local communities]*		1 (+20)	1 (+2)	
Investment in community projects *[TANAPA]*		1 (+20)	1 (+2)	
Utility	0.25	-2.5	0.50	-2.3
Satisfaction	42%	0%	67%	0%
Frustration	33%	83%	33%	75%

Figure 5-15: Inferred strategies – Analysis 1

The results of the analysis also revealed that the strategy of TANAPA is mostly in contradiction with the strategy of local communities. Therefore they do not perceive well the preferred strategy of the organization, so they experience a high dissatisfaction to TANAPA approach.

In Figure 5-16 can be observed that in the best possible scenario for local communities, they get a positive utility of 0.25, while TANAPA gets a utility of 0.50 with its best strategy. That might be explained by the feelings of disapproval local communities experience as regarded to the loss of their traditional rights, resulting in a strong opposition to TANAPA strategies (0.5 – (-2.5) = 3), while local communities experience a considerable lower opposition from TANAPA (0.25 – (-0.25) = 0.5). An explanation of that might be that TANAPA is more tolerant to the Illegal access to the park by local communities than the latter are to the limitation and in some cases extinction of their traditional rights imposed by TANAPA.

Actor A→	*Local communities*	*TANAPA*
Actor B↓	μ Utility	μ Utility
Local communities	0.25	-0.25
TANAPA	all 3 -2.5	all 3 0.50

Figure 5-16: Actors' support and opposition – Analysis 1

5.6.2. Analysis Case 2: TANAPA and different villagers

Similar to the results of the previous analysis, Figure 5-17 shows that TANAPA and the different categories of villagers considered, do not conflict between them about their goals. The conflict found is again in their actions. It can be noticed in Figure 5-17 that TANAPA's actions are in conflict with all villagers' actions except those that voluntary moved to Saadani looking for opportunities, and the other way around. However, this is not the only action conflict found among the actors included in the analysis. A slight thick-line between the villagers that voluntary arrived to Saadani and the rest of the villagers and between the villagers inside the park and villagers from Saadani and villagers resettles, suggests the presence of conflict in action between these actors as well.

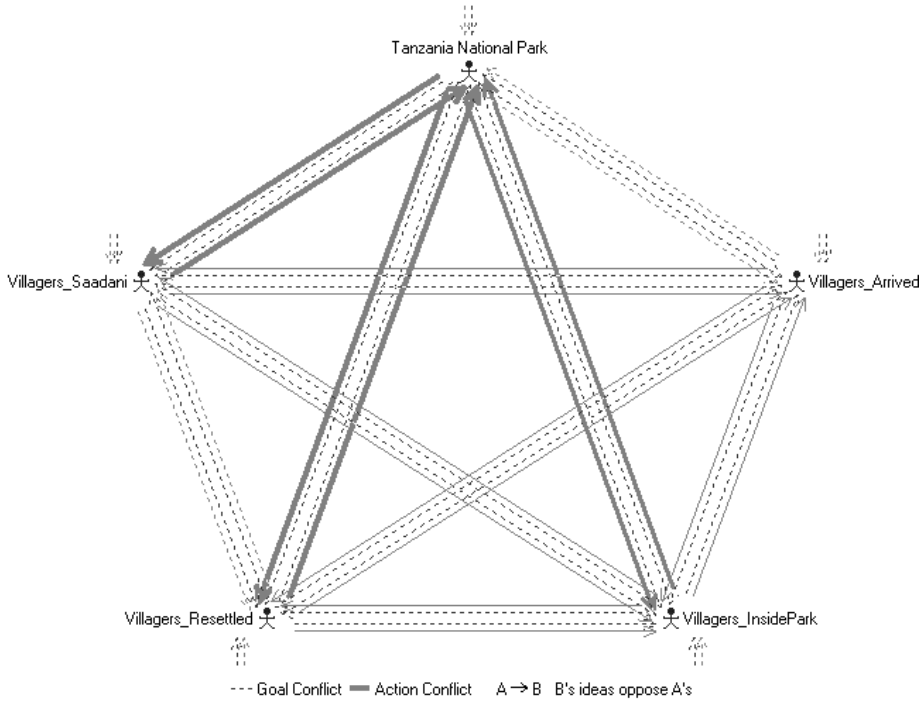


Figure 5-17: Goal and action conflict relation between actors – Analysis 2

The calculation of action conflict values are shown in Figure 5-18. According to the results the highest value obtained for this type of conflict is between TANAPA's actions and Saadani Villagers with 0.65, followed by villagers resettled and villagers living inside the park with 0.54 and 0.50 respectively. Those results can be considered valid if one takes into account that villagers resort to illegal access SANAPA to get the resources they need, which is rejected by TANAPA and conversely TANAPA through the establishment of SANAPA had restricted even extinguished the rights to land and land resources those villagers used to hold. As villagers that voluntary moved to Saadani did not face restrictions in their rights, and thus have no complaints about SANAPA, it is not surprising to get a 0 value in the calculation of action conflicts performed by DANA. Moreover, a result worthy to highlight is the small level of action conflict suggested to exist between each of the various categories of villagers identified, with exception of villagers from Saadani with villagers resettled. Such a result can be explained by the fact that each of this actors faced a different effect or experienced a different situation regarding the establishment of SANAPA which led them to act in different and at the same time not compatible way. In the following chapter these results are discussed in more detail.

Actor A→	TANAPA		Villagers_Arrived		Villagers_InsidePark		Villagers_Resettled		Villagers_Saadani	
Actor B↓	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict	μ Goal Conflict	μ Action Conflict
TANAPA	0	0	0	0	0	0.50	0	0.54	0	0.65
Villagers_Arrived	0	0	0	0	0	0.19	0	0.19	0	0.22
Villagers_InsidePark	0	0.50	0	0.19	0	0	0	0.13	0	0.25
Villagers_Resettled	0	0.54	0	0.19	0	0.13	0	0	0	0
Villagers_Saadani	0	0.65	0	0.22	0	0.25	0	0	0	0

Figure 5-18: Computation of goal conflict and action conflict – Analysis 2

Looking now at the issue of inferred strategies in Figure 5-19, it seems that TANAPA can either be 100% satisfied in the event of its best scenario: No illegal entry to the park for any of the villagers or 100% frustrated if the worst scenario for them takes place. Similar feelings are probably to experience the villagers that arrived to Saadani, meaning for them the worst scenario no more actions taken regarding the establishment of SANAPA and the best, an enhancement of the park. Villagers living inside the park appear to get 33% of satisfaction even in the event that his worst strategy takes place. Villagers resettled might get quite frustrated if there is a reduction in the investment in community projects and the current situation keep as it is. And finally villagers from Saadani would get a satisfaction of 70% with changes in the establishment of SANAPA and investments in the community by TANAPA, but its frustration grows till 65% if not only those events do not take place but also if they cannot enter the park.

Actor A→	TANAPA		Villagers_Arrived		Villagers_InsidePark		Villagers_Resettled		Villagers_Saadani	
Factors	Ideal	Worst	Ideal	Worst	Ideal	Worst	Ideal	Worst	Ideal	Worst
Establishment and administration of Saadani National Park *[TANAPA]*	1 (+14)	all 6		all 2	all 5	1 (+14)	1 (+9)	all 5		all 2
Illegal access to the park *[Villagers Resettled]*	1 (+14)	1 (+5)	-	-	-	-	1 (+9)	1 (+4)	-	-
Illegal entry to the park *[Villagers Saadani]*	1 (+14)	1 (+5)	-	-	-	-	-	-	-	all 2
Illegal staying in the park *[Villagers InsidePark]*	1 (+14)	1 (+5)	-	-	-	-	-	-	-	-
Investment in community projects *[TANAPA]*	all 15	1 (+5)		1 (+1)	1 (+4)	1 (+14)	all 10	all 5		1 (+1)
Utility	2.5	-3	1.3	-2	0.25	-0.25	0.25	-3	1.5	-3.3
Satisfaction	100%	0%	100%	0%	33%	33%	50%	0%	70%	20%
Frustration	0%	100%	0%	100%	25%	42%	33%	100%	20%	65%

Figure 5-19: Inferred strategies – Analysis 2

Finally, the comparison of each actor own strategy with other actor's strategies gives some clues about the opposition and support they might give and experience (see Figure 5-20). Firstly, TANAPA is the actor who gets the most when its best strategy takes place (average utility of 2.5), and when it happens the strong opposition comes from villagers inside the park, which could be due to the fact that they feel they might experience an eviction in any moment. Villagers from Saadani are the second actor in getting a high utility (1.5) out of their best strategies. However, in that case they might experience a strong opposition coming mostly from TANAPA. This result is not surprising considering that they highest value of action conflict come from the actions of this two actors.

In the third place, Villagers that arrived to Saadani (with a 1.3 of utility) might get also a relative high utility with its best scenario. Villagers resettled and villagers living inside the park get a low one of 0.5, meaning that given the perceptions conceived for them, their capability to change if conditions turn favourable for them is quite low.

Another thing than can be inferred from Figure 5-20 is that TANAPA's actions represent a strong opposition to all villagers (high values in first column), while villagers inside the park are the most 'tolerant' in perceiving the strategies of other actors.

	Arena I→	Interaction SANAPA - local villagers									
	Actor A→	*TANAPA*		*Villagers_Arrived*		*Villagers_InsidePark*		*Villagers_Resettled*		*Villagers_Saadani*	
Arena II↓	Actor B↓	μ Utility		μ Utility		μ Utility		μ Utility		μ Utility	
Interaction SANAPA - local villagers	*TANAPA*	all 15	2.5	all 15	0.50	all 15	-0.25	all 15	0.25	all 15	0.50
	Villagers_Arrived		2.3		1.3		-0.25		-0.25		0.50
	Villagers_InsidePark	all 5	1.8	all 5	0	all 5	0.25	all 5	-0.75	all 5	-1.8
	Villagers_Resettled	all 10	2.5	all 10	0.50	all 10	-0.25	all 10	0.25	all 10	0.50
	Villagers_Saadani		2.5		1		-0.25		0.25		1.5

Figure 5-20: Actors' support and opposition – Analysis 2

Comparing the results of both analyses, it was noticed that the first case showed an expected level of conflict between TANAPA and local communities, the analysis of the second case allowed identifying that actually the different categories of local communities differ in the way they perceive the issue of the establishment of the park. Thus the level of disagreements between them and the authority of the park, regarding the way things should be done also differ. This is an expected result taken into account that each group of villagers was not affected in the same way after the establishment of the park. In fact for some villagers, those who voluntary moved to Saadani, the park represents a good opportunity to increase their incomes.

Having the assumption that villagers who were shifted from the park are the most affected with the establishment of SANAPA, it is surprising that the result of the analysis points the villagers from Saadani as those with higher disagreement with TANAPA. An explanation for that may be the fact that one goal of the villagers from Saadani is the 'No reductions of rights to land and land resources'. This goal is most directly affected by the establishment of the park with just a factor between them (elements in sequence). Villagers resettled identified the 'elimination of resettlements' as their goal which is caused also by the establishment of the park; however, this is not as direct as the previous case but influenced by a arrangement of some elements between (in combination) like compensation, the extinguishment of their rights, etc. (see Appendix C).

5.7. Selecting policy instruments

Policy instruments, as previously introduced in Chapter 2, are the tools often included by policy makers during the implementation of diverse measures, to attain the objectives of a policy. There is a variety of instruments that can be adopted according to the type of policy and measure implemented. The selection of the optimum instrument for each case is an important task; the instruments should be the most

efficient, effective, equitable and acceptable for both, communities and authorities (Australian Public Service Commission 2009).

Some instruments already established with regard to national parks and SANAPA includes:

- Regulation: NEP (1997) and NPP (1994). (see Sections 4.4.5 and 4.46).
- Direct provision: General Management plan. Periodically implemented or updated. It includes the beliefs for the park and the approaches for breaking problems and attaining identified management objectives. It is included in the NPP. Table 4-4 presents the responses to the existing problems suggested in the Management Plan of the park of 2003.
- Community Conservation, extension and "ujirani nwema" program (see Section 4.8.1).

In the context of this research, the selection of the optimum instruments to reduce the observed conflicts between the establishment of SANAPA and rights, especially rights to land and land resources of the local communities, was carried out having on one side the conceptual framework DPSIR. It includes the general elements that are taking place in such a 'system', like the policies guiding the regulation regarding protection of the Environment in general and the establishment of national parks. On the other side, the analysis of the perception graphs for the involved actors using the DANA software, which includes the relevant elements of the 'system' according to each actor's view. This allows the inclusion of more specific aspects.

With the output of these means, it was possible to identify the elements that are most likely causing conflicts. They are as follows:

- The illegal access to SANAPA by local communities
- The extinction of traditional rights of the local communities due to the establishment of SANAPA.
- The reduction of the livelihoods of the local communities
- The lack of proper communication between the parties involved.

Considering the sources of conflicts previously listed and the four categories of instruments proposed by the World Bank, 1997 and cited by Sterner (2003) and Sida(2003) and the provisions of the environmental policy: a list of possible instruments to be applied is proposed (see Table 5-1). The categories of instruments are: Using markets, Creating markets, Environmental regulation and Engaging the public. The instruments are derived from literature and analysis of the data collected during the interviews.

Table 5-1: Proposed instruments to be included in the implementation of SADANI

Instrument	***Description***	***Conflict addressed***
Using markets		
Targeted subsidies	Subsidies for the development of alternative economic activities in the local communities, which do not depend on natural resources inside the park.	- Illegal access to SANAPA. - Reduction of the livelihoods of the local communities.
Creating markets		
Water easement	Considering that the rivers running inside the park are the only access that the local communities have to freshwater, it is considered relevant the creation of a water easement. The discharge point should be outside the park and the local communities could be in charge of its maintenance.	- The illegal access to SANAPA by local communities. - The extinction of traditional rights of the local communities due to the establishment of SANAPA. - The reduction of the livelihoods of the local communities.
Environmental regulation		
Zoning	Establishment of a buffer zone or transition zone around the villages surrounding the park. In such zones villagers can be allowed to access certain natural resources with certain restrictions and encouraged to develop community based conservation projects.	- Illegal access to SANAPA. - The extinction of traditional rights of the local communities due to the establishment of SANAPA.
Engaging the public		
Information provision	Continuous diffusion of printed materials, e.g. fliers, posters, about the relevance of SANAPA and about its management, e.g. budget, facts, achievements (community-targeted).	- The lack of proper communication between the parties involved.
Community participation	Periodic dialogues between TANAPA staff and local communities (multi-way dialogues).	- The lack of proper communication between the parties involved.

5.8. Concluding remarks

Modelling and analysis of perceptions can be seen as a good way of identifying divergences in views of different stakeholders related to an issue, therefore allowing to define whether there is conflict between them. In this research, DANA software was used as a computer-based tool for performing such analysis. Five stakeholders were identified in the 'system SANAPA-local people', being one TANAPA itself and the others four different categories of local villagers. After modelling their perceptions in DANA, two analyses cases were conducted: (1) TANAPA and integrated local villagers perceptions, meaning that all the four categories of local people were grouped in the same perception view; and (2) TANAPA and different villagers' perceptions, in which a simplified view of each different villager's category was considered.

The first analysis case revealed that the stakeholders only diverge in the action that should be taken, but not in the goals for the 'system'. In summary, local people experience dissatisfaction to their traditional rights extinction, with the imposition of SANAPA establishment, while TANAPA experiences dissatisfaction with the illegal access of local people to the park. According to the analysis in DANA, the inferred best strategy from the point of view of local people is to increase the illegal access to the park and have more investments in community projects by TANAPA. Interestingly, their worst strategy would be to just keep 'things as they are'. From the point of view of TANAPA, however, the best strategy is to have an increment in illegal access to the park by local people, while preserving their investment in community projects. Obviously, the worst case for them is to have an increase in illegal access to the park, but also to reduce the investment in community project. That clearly shows the divergence in actions that should be taken according to each stakeholder, particularly in relation to illegal access to the park in which local people want more of it, while TANAPA wants it to reduce. The differences in experience of the other stakeholder when the best strategy of one is taken, allowed identifying that apparently TANAPA is more tolerant to the illegal access to the park by local people, than the latter to the extinction of their traditional rights.

The second analysis case kept the general trend of the first one, with only conflict in the actions to be taken identified. An interesting result was that not only there was conflict between TANAPA and the different categories of villagers, but also that some of the latter were in conflict to each other. This means that different categories of villagers also diverge in the actions that should be taken, and in what they experience from these actions. The category of villager that mostly rejects the actions to be taken according to TANAPA are those that stayed inside the park, which can be explained by the 'feeling' they have that they might experience an eviction at any time.

After developing a high-level explanation of the system between establishment of SANAPA and local people by means of the DPSIR framework in Chapter 4, and the modelling and analysis of stakeholder's perceptions that provided a more in-depth insight of the issue in this chapter, it was possible to identify the elements that are most likely causing conflicts. A proposition of policy instruments to be included in the implementation of SANAPA was then made in order to reduce the existing conflicts observed.

6. Discussion

6.1. Introduction

This chapter presents further discussion on the results apart from the ones held along with the results of DPSIR framework and the perceptions analyses with DANA. Section 6.2 reflects on the event of the implementation of Saadani, the effect this brought to local communities is discussed in Section 6.3. Methodological considerations are drawn in Section 6.4, pointing out pros and cons of the methods adopted in this research, the usefulness of the drawn indicators for the DPSIR framework (Chapter 4) and the proposed policy instruments for tackling the conflicts observed in the stakeholders' perceptions analysis (Chapter 5). The limitations of the research are discussed in Section 6.5, followed by concluding remarks (Section 6.6)

6.2. Implementation of Saadani National Park as an environmental measure

As it was already reported in this document, the regulatory framework of Tanzania is full of provisions regarding environmental issues, a matter that is emphasized in the NEP. In fact, cross-sectoral laws address the protection of the Environment in different aspects, like forestry, wildlife, fisheries, water and land, among others. All this together with the fact that almost 40% of the area of the country is devoted to protected areas, gives the idea of the relevance, at least institutionally, given to this issue in Tanzania.

Such a proportion of land allocated for protection in Tanzania, supports what Udaya Sekahr (2003) and Cernea et al. (2006) stated when both referred to protected areas, specifically national parks, as an increasing preferred alternative by national and international organizations in environmental conservation's efforts. However, this approach as several authors point out (see Chapter 2) brings an additional and conflicting issue related to rights to land and land resources of people neighbouring those areas as observed in SANAPA.

Tracking back the basis of these measures in Tanzania, it was found that the Wildlife Policy introduces the strategy of establishment and upgrading of protected areas along with the call for survey and acquisition of land titles deeds for all these areas. This last issue seems to be missed in the establishment of SANAPA since according to what our informants expressed, there was not registration found or that we could have access to, to say the contrary. This might be explained by two facts, one is that most of the rights people had before the establishment of the park were customary rights, not registered (as people interviewed confirmed), so when the park was established, having no preceding registration there was no registration to update. Another issue that might take place is the lack of communication between governmental organizations, in this case TANAPA and land registration office.

6.3. Effects of the establishment of SANAPA on local communities

6.3.1. Lost of rights

The national constitution of Tanzania entitles any person to own property and, in the cases when someone would be deprived of it, calls for adequate and fair compensation. In attendance of this, the land law sets that all rights of occupancy are liable to be revoked under the 'good' cause, and on every occasion that the President considers it is done in the 'public interest'. It is assumed then that public interest is a paramount concept, prevailing over any individual or private interest.

Furthermore, in what could be interpreted on one hand as a contradiction and on the other hand as a balancing point to what was just discussed: the EMA indicates that the interest of the local communities in or around the area should be observed in the declaration of an area as protected. The declaration, in this case, should be done by the MNRT. It can be said that different governmental actors in Tanzania are empowered in the basis of different points of view regarding the same issue: protection of the environment by establishment of protected areas and the rights of local communities.

Agreeing with the fact that protection of the environment is essential, given all the connotations the Environment has on human life, as Randolph (2004) suggests, hence one can consider environmental protection as a subject of public interest. In this sense, measures implemented by an environmental authority, aiming to lessen or prevent negative impact on natural ecosystem are considered valuable and required to be performed. The conflicting issue however, is that an environmental measure like the establishment of a national parks imposes from its concept, restrictions to human interactions: none kind of use is allowed except for tourism. It happens that protection of the environment takes precedence from rights people may hold, like in many cases around the world (see Chapter 2), and SANAPA was not an exception. Outputs of the analysis in this research (DPSIR framework and DANA software) of the data gathered in the field, confirm this issue.

Before the establishment of SANAPA in 2005, there were already various communities settled in the area with a long tradition of use and access to land and natural resources in general, both outside and inside the area declared currently as a national park (see Section 4.5.2). In application of the regulatory framework, TANAPA identified, whether after or before of the establishment of the park, those people settled inside the park and evicted them. Nothing wrong with this approach, according to the legislation, but the way it was done can be debated.

In agreement with Doremus (2003), data collected in the field provides evidence about the effect of SANAPA on rights of local communities. Those that lived inside the previous game reserve used to have some restrictions to access natural resources, while those only neighbouring the SGR had none restriction but open access to the resources. At the upgrade for SANAPA, the former experienced an increase on the levels of restriction, but that was much more drastic for the latter that suddenly had an all-restriction to their traditional right of access to natural resources at their hand.

There is another issue that it was noticed, which have been brought by the park. The community established in Saadani ended up without any land where to expand (see Section 4.6.1); the results of the census of 2002 indicate a population of 800 inhabitants in the village. Considering the approximate

growing population rate of 2.9%, around 1000 inhabitants would be currently settling there (without including migration rates), which can be interpreted as a higher demand for allocation of land. Additionally the village is surrounding by the park to the north, south and east side and by the Indian Ocean to the west.

During the interviews, villagers expressed that they have little or no clarity about the boundaries of the park, hence they do not have any security where the village land ends and with it their recognized rights in the village and the resources on it.

This all leads to infer about the shortcomings of the land administration system in Tanzania by failing to pledge both the rights local communities and security of tenure. There is also not observed cooperation or support between land and environmental management.

6.3.2. Reduction of livelihoods

Local communities in Saadani, Buyuni and Uvinje are very dependent on natural resources: firewood, building materials (houses, fences), tools and household stuff, handicrafts for small business, timber, water supplies, dyes, fibre, fruits, plant for traditional medicine, and of course land for dwelling and for uses like agriculture, livestock keeping etc. Fishing is also one of their economic activities. Natural resources are the means for the sustenance of these communities (see Section 4.7.1).

As already Cernea and Schmid-Soltau (2006) have already discussed it, this linkage is by essence non compatible with the establishment of national parks, nevertheless an issue that cannot be simply taken for granted, otherwise conflicts in interests may arise and both local communities' welfare and environmental protection in the area might be disturbed.

This is the reason why local communities illegally access to the park (see perceptions graphs in Section 5.5). SANAPA authorities cannot expect them to assume an overnight change and adaptation to a nonexistence use of natural resources inside the park, especially if there are no initiatives to work in partnership, providing sustainable and alternatives means for these communities. This is an assumption in agreement with Mbile et al. (2005), who argue that due to the effects on their livelihoods, local communities are to a great extent encouraged to take part in the decisions taken about a national park. Therefore local communities should not be considered as part of the problem but as a counterparty in achieving environmental protection objectives.

In Saadani village, giving the current area available, the increasing number of inhabitants, the uncertainty about boundaries and the common conflicts with wildlife (e.g. crop destruction), fishing is an appeal economy activity (see Section 4.4.2).

6.3.3. Community displacement

The effects of SANAPA in local communities also included involuntary displacement and resettlement of local villagers: in Saadani some families were found as have been shifted from the park, with no support from TANAPA, only the payment of a compensation that did not meet their expectations (see Section 4.6.2).

As human beings, we are closely related to land; the establishment of such connections is further evident in indigenous and rural people due to the dependency they hold to natural resources and also due to cultural and traditional legacy. The data collected in Saadani village during the interviews of the resettled people (see Appendix B), coincides with what Cernea et al.(2006) already described: involuntary displacements as a consequence of the implementation of a national park, brings a chain of consequences; negative consequences to local communities.

After SANAPA was implemented, several local communities lost their place of settlement, including the land they occupied and the community in which they were living. As a consequence, they lost their traditional rights to natural resources which in turn caused the loss of their means of livelihood (crops, area for livestock keeping) finally generating impoverishment. This was evidenced in the models of the perceptions graphs for the villagers. The break of community ties, culture and lifestyles might not be an evident effect of SANAPA, but yet it is. Hardly, the payment of compensation may offset all these adverse effects, even if it is done with the highest standards of quality and assessment.

In Saadani village, displaced people who were interviewed, share the stated desire to return to their previous places. Almost five years later of the establishment of the park, they are struggling to cope with their new situation, with little or none support from any authority. This is an issue that adds marginalization to their current condition.

6.3.4. Unfair compensation

If at the time of proposing the upgrading of SGR, TANAPA followed what is stipulated in the legislation about national parks, and then it is assumed that not merely environmental aspects like the importance of the Ecosystem, suitability of national resources and feasibility of an adequate size were taken into account. Aspects like land ownerships, acquisition costs and threats to the resources, including in the last the pressure of a growing population might also be considered. This would mean that the statutory rights of occupancy granted in the area as well as the respective compensation to pay analysed beforehand. However, it is not clear how the procedure should have been in the case of traditional and unwritten rights that local people may hold; and moreover, in the event of compensation, how to value this.

During the analysis of the data collected, it was realized that legislation in Tanzania does not envisage mechanisms for compensation after revocation of such ‘de facto’ rights to natural resources as people surrounding SANAPA had.

People interviewed complained about the compensation paid to them, not only because they were not properly informed about it, but also because the amount given was never detailed and supported. There was not enough data to check whether this was true or not, but what can be said about this is the existing awareness of the government about it expressed in the NLP. In this document, it is recognized the weakness of the legislation in providing principles for assessment and quality of it, thus is not surprising to find such complaints.

6.3.5. Emerging conflicts

Considering the negative effects the park brought to local communities, it is not hard to understand the presence of conflicts between the park administration and the local communities. Analysis performed with DPSIR framework (see Chapter 4) and DANA software (see Chapter 5), based on the data collected, allowed the identification of conflicts between local communities and SANAPA. The results of this analysis coincides with the discussion about possible conflicts emerging in the event of the establishment of protected areas, raised by Vatn (2005) and Bergseng (2009). Contrasting the classification of conflicts that these authors proposed with the results obtained in this research, it can be realised that due to the establishment of SANAPA, TANAPA and local communities experiences four different disagreements: conflicts of interest regarding the compensation paid, conflicts of rights regarding the extinguishment of rights, conflicts of facts regarding the decrease of livelihoods and conflicts of value regarding their perceptions.

This last type of conflict could be analysed using the perceptions graphs of the stakeholders. Several authors (see Chapter 2) argue that the approval of protected areas by local communities will depend on how well it goes with their goals. Analysis of the perceptions shows that actually the different categories of local communities differ in the way they perceive the issue of the establishment of the park. Thus the level of disagreements between them and the authority of the park, regarding the way things should be done, also differ. This is an expected result taking into account that each group of villagers was not affected in the same way after the establishment of the park. In fact, for some villagers, those who voluntary moved to Saadani, the park represents a good opportunity to increase their incomes.

Following also with this rationality, it was assumed that villagers who were shifted from the park are the most affected with the establishment of SANAPA. In contradiction with the latest, the results of the analysis points the villagers from Saadani as those which higher disagreement with TANAPA. An explanation for that may be the fact that one goal of the villagers from Saadani is the 'No reductions of rights to land and land resources'. This goal is most directly affected by the establishment of the park (see Appendix C). Villagers resettled identified the 'elimination of resettlements' as their goal which is caused also by the establishment of the park; however, this is not as direct as the previous case but influenced by a combination of some elements between like compensation, the extinguishment of their rights, etc (see Appendix C).

6.4. Methodological Considerations

6.4.1. Conceptual framework

The conceptual framework implemented in this research, DPSIR, proved to be a very useful tool to connect under major categories all the elements, or at least the elements that could be identified with the data collected, which are relevant for the subject of study. It allowed presenting them in a very simple but still indicative way, several issues that are taken place in the establishment of SANAPA and its effect in the rights of local communities, which is the major advantage of this framework.

On the other hand, as discussed by Svardtad et al. (2008), DPSIR major advantage can turn to be a weakness, as it may lead to simplistic representations of complex issues as the one dealt in this research.

The identification of the elements under each category of the framework was primary done based on observations, interviews, secondary data and literature, but the construction as such and the establishment of the causal effects relationships was done on the basis of reasoning and assumptions of the data collected during the interviews.

An additional characteristic of this framework is its flexibility; the origins of the framework provide evidence of it. This characteristic has allowed the framework to be widely accepted and implemented for creation of environmental indicators. Although the traditional form of this framework include environment as the central issue to be analysed, Svardtad et al. (2008) provide insights about their potential use for studies dealing more with social and economic factors. That was the root to adapt this framework in order to make it applicable to this study (see Section 3.6).

The integration of DPSIR framework with the modelling of perceptions is conceived as a complementary approach to increase the analysis and understanding of the relation between the establishment of SANAPA and rights of local communities. While DPSIR provides a general vision and connection of concepts taken place in the subject of study, the modelling of perceptions graphs provides the perspectives of how those concepts are connected according to the actors involved.

6.4.2. Deriving indicators from DPSIR

The formulation of indicators from the DPSIR framework coincides with the approach supported by Balint (2006); he highlights the importance of identifying relevant factors to improve community-conservation approaches close to protected areas and used them in the form of indicators to foresee the success or failure of initiatives taken for environmental conservation. In fact, indicators are commonly used to determine the performance of policy implementation of different subjects.

The indicators in this research observe some characteristics that were discussed by Veleva et al. (2001) related to quality of indicators, such as they were abstracted based on the data collected in the field which despite of the encountered limitation is assumed to be accurate. The indicators are both qualitative like: *economic activities taken placed around protected areas involving the use of natural resources* or *means used to inform the community about the decisions and projects to carry out*, and quantitative like: *percentage of the population that recognises the boundary of the PA* or *number of people neighbouring the protected area*. Also they address all the categories included in the conceptual framework from where they were deducted: Driving forces, Pressures, State, Impact and Responses.

Furthermore the indicators are kept simple, easy to implement and evaluate, thus having an important role in helping to understand and detect possible sources of conflict after the establishment of a national park, specifically in this case SANAPA.

DPSIR framework offers a structured way of deriving and understanding issues associated to a given situation or 'system'. In this sense, the developed framework should be logically understandable to be considered as well-performed and eventually useful. In the case of this research, the aforementioned characteristics are claimed to hold, and therefore the DPSIR seems to capture considerably well all the main issues associated to the relation between the establishment of SANAPA and the repercussions over local people's lives.

6.4.3. Perceptions graphs

Inclusion of the perceptions of the most relevant actors involved in the establishment of the park, essentially local communities and the park authority TANAPA, helped to provide the insights of the cause-effect relation of their actions and the conflicts between them with regard to SANAPA. This is the main reason for the use of this approach, such valuable output would have stayed hidden with a different approach, e.g. a merely statistical analysis of the data gathered during the interviews. Mbile et al. (2005) support such approach when referring to the effects of national parks in local communities' livelihoods, they argue that park's authorities should admit the relevance to include the local communities perceptions, aptitudes and desires.

However, the modelling of perceptions is not an easy task to accomplish: it demands a lot of time during the interviews to get the key concepts and factors relevant for each actor to be included in the analysis, a condition that maybe the questions in themselves did not address directly. This would suppose the access and collaboration of all actors involved, which is not possible in all the cases. As it was already discussed in Chapter 3, it was not possible to get the cooperation of TANAPA's staff in providing relevant data for this research.

The modelling also demands a lot of time analysing the information gathered in order to establish the relationship between the concepts included in the model; the capability and performance of the selected tool, when applicable, to develop the models also adds limitations to the application of this methodology.

Giving the type of the research carried out, the data collected is mostly of qualitative kind, and hence the analysis and interpretations given to it included a number of assumptions. The perceptions graphs included in this document do not reflect the whole view and opinions of the actors analysed, due to limitations in data collection (see Chapter 3), and because of the inherent limitations of an analyst to get a complete view of all the factors that are taking place in the issue analysed, not to mention the complexity embedded in the issue in itself and in the attempt to model how people perceive it.

With this type of analysis all actors are balanced and equally influential. It is not a unilateral analysis: the ideas and desires of each of them can be represented; a condition that would help the analysis of the current situation but also the anticipation of possible alternatives to be implemented to get a win-win situation.

To perform the analysis of the perceptions graphs in DANA, the semi-quantitative application selected for modelling, it was required to simplify the initial perceptions graphs constructed, to perform the calculations. That might result in a reduction of the reliability of the results, but on the other side, the complexity to interpret the results is also reduced which results in a more straightforward interpretation, e.g. when the model is simple and includes less actors, the impacts in the results after a variation in the size of a causal link might be easier tracked and consequently understood, than when the complete models includes a lot of actors, actions and factors.

In general, the results of the analysis performed by DANA can not be taken as complete, because of the implicit limitations they impose. Even so they provide a good basis for understanding the issue through discussions of the outputs. Furthermore the validation of the model should ideally be performed by the

actors themselves, which would give relevant inputs to improve an initial approach; but also the analysis should include the perspective of different analysts. Additionally, the outputs of the analysis of conflicts are quite sensitive to the size of the connector and the way factors are linked (in sequence or in combination), because DANA uses probabilistic vectors to calculate the effect of an action in a goal, therefore the highest the combination of elements in between, the lowest the probability of the strength of the effect. Again, discussions with the actors represented are the best way to ensure the quality of the results.

The analysis of two simplified models: one assuming all villagers as one actor and the other, an independent view of different types of villagers identified, is considered as a way of validating the models constructed.

6.4.4. Proposing instruments from conflicts detected

Policy instruments as tools that assist the achievement of policy objectives are also worthy issues to look at in the context of this research. Because of the complexity of the issue here analysed, the proposed instruments supposed a combination of different channels addressing detected conflicts of the establishment of SANAPA. This approach is assumed to work better than trying to tackle each problem individually.

However, the identification of the best instruments demands a judicious study not only about the impact the instrument will have, but about the feasibility in cost, in administration, in time, among others factors. Due to time constraints, such a study was not carried out before proposing the instruments previously listed (see Chapter 5) and neither there was a joint discussion with the actors potentially involved in the implementation of such instruments. That, of course, undermines the validity and approval of them, but on the other hand, they are a good starting point for discussion and debate of the parties involved. Using the output of DPSIR framework as a background and the output of DANA analysis as guider to identify most prominent or conflicting issues, is it possible to provide a more reliable, though still not complete, group of instruments.

Another important issue to consider is that the perceptions and therefore the behaviours of the actors involved in the event of the establishment of the park will undoubtedly influence the performance of the instruments. Knowing at least partially, because of the impossibility of getting a complete knowledge of an actor perception, the way actors think elements interact, their goals and their interests, gives a supportive basis for the identification and implementation of possible policy instruments. This can be assumed as an extension of the advantages of perception graphs modelling.

6.5. Limitation of the research

As it was discussed in Chapter 3, the data collected was limited because of many factors like short time available for fieldwork, long information request's procedures and tough accessibility of the park, both physically and of its staff. Information collected from secondary sources, observations and literature enriched the data collected during the interviews so that the analysis could be done properly.

Some information missed that would have been relevant for this research includes: Cadastral and land use information from Bagamoyo district, titles of local villagers (rights of occupancy), a higher number of interviews with villagers and inclusion of those from other communities surrounding the park, discussion with TANAPA's staff and in general access to information about the park.

The topic of this research is a quite complex issue that can be addressed in several ways and with different degrees of extension and depth. The approach here adopted was extensive enough to go from explanation of constitutive elements, identification of conflicts till proposal of instruments to reduce those conflicts. And depth enough to use a conceptual framework to explain the relation of such elements till the representation of the views and perceptions of the actors involved.

Considering the above, the questions set in the context of this research were sufficiently specific to be addressed with the data collected, which despites of being limited is considered accurate because of the direct collection with interviews and different actors. Nonetheless, the methodology adopted, mainly DPSIR and DANA software, requires wider and detailed information to increase the precision of the results. Specially modelling of the actor's perception, which is a technique that imposes a somewhat higher degree of subjectivity than a conceptual framework.

An influential element for the reliability of these methods, apart from the data collected, is the follow-up discussions with the informants in the case of DPSIR, and with the actors in the case of DANA software, of the output of these methods and incorporation of their observations to improve the results. Same should be applied for the policy instruments proposed.

In general the two main methodologies applied after the fieldwork suited the intention of responding the research questions and seemed to complement each other. They also gave the basis to research more about them and expand their potential of usefulness in land administration domain.

Regarding the issue of the selection of the case study, it would have been more interesting and challenging to conduct the research in a protected area with lower degree of protection than a national parks and where environmental policies have been implemented, as it was the initial planned approach of this research. That would allow analysing the degree/type of effect that a certain environmental measure brings to different possible existing rights like water rights, forest resources rights, occupancy rights, pastoralist, etc. A national park calls for the extinguishment of rights and consequently eviction of local communities.

6.6. Concluding remarks

The approach of this research seems to provide a good basis for understanding the issues related to the establishment of a protected area and the repercussions of it in the local communities near or inside the area. The combination of data collection in the field area and analysis using both DPSIR and DANA methodology helped to identify the lost of rights, reduction of livelihoods, community displacement and the grant of an unfair compensation, as the apparently most relevant effects of the establishment of SANAPA, raising some effects between the different actors involved. The perception analysis of the stakeholder's views in DANA provides a complement to the high-level understanding of the 'system SANAPA-local people' given by DPSIR framework. But ideally we point out that the validation of

those perceptions modelled should be performed by the actors themselves, which was obviously not possible in this case. The derived indicators were attempted to be simple, easy to implement and evaluate, as a useful way of understanding and eventually detect possible sources of conflict after the implementation of an environmental measure by establishing a protected area, in this case SANAPA. Policy instruments were then proposed toward tackling the observed repercussions of the environmental measure over local people lives. They are considered to be an initial attempt, as always an instrument design should take into account feasibility as well as other factors. The limitations faced in this research were fairly overcome; but we acknowledged them in any case as a good scientific practice in the discussion above.

7. Conclusions and recommendations

7.1. Research questions revisited

Despite the limitations encountered during the data collection and thanks to the use and implementation of DPSIR conceptual framework and DANA software, this research study has answered the four research questions initially raised.

1. What are the elements that influence the effect-relation between an environmental measure and the existing rights to land and to land resources in a national park?

In Chapter 4, using an adaptation of the DPSIR conceptual framework (see Table 3-3) it was identified and explained the elements that according to the data gathered seem to be influential to define the effect-relation between environmental measures and the existing rights to land and land resources of the local communities. In the context of this research, the measure analysed is the implementation of SANAPA in the districts of Pangani, Handeni and Bagamoyo in Tanzania. The elements were listed under five different categories: Driving forces, Pressures, State, Impact and Responses (see Figure 4-1); these categories are related on a causal basis.

Both data limitations and assumptions made during the construction of the framework – that were not later confirmed by the respondents – decreased the reliability of the output; however, the framework seems to be consistent and capture significantly well and logically understandable the relevant elements associated to the establishment of SANAPA and the effect on local communities.

2. *Which are the possible indicators of conflicts between the implementation of an environmental measure (e.g. establishment of a national park) and rights local people hold*?

The formulation of indicators is one of the key aims of the DPSIR conceptual framework. In Section 4.9 indicators of the identified elements in the relation between SANAPA and local communities are drawn. The indicators are of both qualitative and quantitative type such as *economic activities taking place around the protected area and which involve the use of natural resources* and *number of people settled around the protected area per square kilometre*.

Due to the fact that the indicators were derived from the elements identified in the conceptual framework, the quality of the former defines the quality of the indicators. But considering that they are meant to allow the discussion and analysis of the general factors taking place when an environmental measure specifically a national park is established, indicators here presented are assumed to be logical and in accordance to the identification of sources of conflicts.

3. How do stakeholders perceived the implementation of environmental measures like the establishment of a national park?

Stakeholders and in general actors in diverse policy subjects are believed to behave according to the perceptions they have about the issues that concern them. Since different actors may have different perceptions about the same issue, disagreements may arise between them, causing in most of the cases conflicts.

In the context of this research, depictions and analysis of the perceptions graphs of the assumed most relevant stakeholders involved in the establishment of SANAPA were carried out using the DANA software (see Chapter 5). The perceptions were constructed on the basis of the data collected and the analyst's view with assumptions regarding how much one factor influences the other, for instance. In fact, the perception graphs are the analyst view about the 'system', in this case concerning the establishment of SANAPA and the local communities, but taking into account the data gathered.

Thought the validation of the models by the included stakeholders was not possible, the output of the analysis seems consistent in reporting a conflict of actions in two models constructed (see Appendix C). The first one included TANAPA on one hand and different local communities considering as having the same interest and values, hence represented in a single stakeholder, on the other hand. A second model included to break down the perceptions of the stakeholders as follows: Villagers from Saadani who motivated by the reduction of their livelihoods as a consequence of the loss of their rights to land and land resources inside the park, constantly incur in illegal access to SANAPA. Villagers from Uvinje and Buyuni, who despite that have been told to moved, remain settling inside the park, clinging to their traditional rights. Villagers that were living inside the park and were shifted and Villagers that now are settling in Saadani after moving voluntary from their original places, looking for opportunities that the park would bring for them.

4. What are the best suitable instruments to be included in the implementation of environmental measures with an accepted level of effect by a right holder in a national park?

After the analysis of the perceptions graphs and the identification of the elements that might be bringing more tension between the stakeholders, some policy instruments – assumed to be the ones addressing properly the identified conflicts – are proposed to be included as a response to reduce the conflicts raised after the establishment of SANAPA. Those instruments include subsidies for the development of alternative economic activities in the local communities, creation of a water easement, establishment of a buffer zone around the villages surrounding the park and a continuous diffusion of information with periodic dialogues between TANAPA and local communities (see Section 5.7). Validation of those instruments by the counterparts is needed.

7.2. General conclusions

Drawn about the data

i. More than 35,000 people is living around of what is today SANAPA, a national park in Tanzania declared in 2005. The local communities had a long tradition of use and access to land and natural

resources in Saadani Ecosystem, but in application of the existing regulatory framework the traditional rights to access resources inside the park were extinguished and people with rights to settle there were evicted.

ii. Due to the fact that most of the rights local people had before the establishment of the park were customary rights, there was not registration of land titles deeds for all these areas.

iii. Compensation paid to evicted people seems to be unfair from the perspective of the villagers. According to them, they were not properly informed.

iv. The main economic activities of the local communities of Saadani, Buyuni and Uvinje, the villages were the fieldwork was carried out, are fishing and farming, and in a small proportion livestock keeping. They are very dependent on natural resources. Loosing the access to the area of the park implies their impoverishment.

v. After the establishment of the park, the community settled in Saadani ended up without any land where to expand; the village is surrounding by the park to the north, south and east side and by the Indian Ocean to the west.

vi. Villagers have little or no clarity about the boundaries of the park. Therefore, they do not have any security where their village land and about the rights they have.

vii. Although most of the villagers agree in the negative effect of the park, they also recognize its advantages. The park also seems to be beneficial for "foreign" villagers, who moved around it looking for opportunities.

Drawn about the analysis of the data

viii. National Land, wildlife, NEP and national parks policies in Tanzania are the identified policies that appear to influence the most the issues related with the establishment and administration of protected areas in Tanzania, particularly national parks.

ix. The four main negative effects of SANAPA on local communities are: the loss of traditional rights, resettlements bringing community disruption, reduction of local communities' livelihoods and payments of compensation full of complaints from villagers evicted.

x. Though some responses are been given to local communities like infrastructure development, training, among others, villagers do not see a real investment in the development of their villages and improvement of their qualities of life.

xi. All villagers were affected by the establishment of SANAPA, either positively or negatively. Also different types of villagers are affected in different ways and therefore a thorough analysis to come up with solutions to solve conflicts need to consider the differences in the way people are affected.

Drawn about the methods

xii. The use of interpreter during interviews can limit the collection of key data and reduce the quality of the data collected in general, especially when the interviews are semi-structured.

xiii. The DPISR framework and DANA modelling methodologies seems to be complementary. The first one allows the analysis of the general elements taking place in a policy subject, while the second one helps to places those elements in the way each actor perceive them.

xiv. Due to their basis on causal relations both DPSIR framework and DANA software need more data in order to give more reliable outputs.

xv. The use of DANA imposes limitations on the complexity of the models of the actor's perceptions graphs. They should be kept simple to not affect the software performance, but also because the results of the analysis are harder to be interpreted.

xvi. The use of simultaneous methodology allows to cross-check of the results and hence their validity and reliability,

7.3. Recommendations

Some recommendations are derived from the research study about the analysis of the relation between land rights and environmental measures in protected areas.

- To improve the quality of the outputs of a research using the same methodology as in this context, the fieldwork ideally should be carried out in two steps. An initial step should aim to collect all feasible data aiming to identify the main elements that are taken part in the system of study and to identify the causal-effect relation between these elements. Interviews should be flexible and in a brainstorm-basis. With the data gathered in this previous step, an initial DPSIR categories and elements should be drawn as well as the model of the actors' perceptions. Those drafts should be the basis for a second 'round' of data collection. The initial results should be discussed with the relevant informants; for those who shared interest and values the discussion should be always in groups.

- Although DPSIR has proved to be a flexible and adaptable framework. The adaptations of concepts should be judiciously analysed to determine the degree of distortion results might have, thus the quality of the outputs.

- After the identification of indicators to understand the effect of an environmental measure in the rights of local communities, it is recommended the identification of the desired or ideal state for each of the elements that are included in the analysis. Thus, comparative studies can be performed between the ideal and the current condition of the elements and goals can also be settled. It can be also recommended the study of allocation of weights for each indicator.

- Due to the fact that actors behave according to their interests and values in a policy issue, the modelling of actor perceptions should first identify the different types of interests, for instance, the type of right a stakeholder may hold. Those who share values and interests can be jointly modelled and represented.

- Taking into account that DANA allows the analysis for evidence of conflicts between actors, and assuming policy instruments as a relief for local communities of negative caused effects from environmental measures, further analysis of the acceptability and efficacy of the proposed instruments might be included in the models of perceptions.

- Additional study is needed about the reliability of the results of the analysis of actors' perceptions graphs that DANA produces.

- Study of the applicability of DANA software and in general of the concept of perception modelling, to study the aptitudes and viewpoints of stakeholders regarding land administration issues e.g. registration, land titling, and land consolidation projects, among others.

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Appendices:

Appendix A: Semi-structured interview questions

A1: Villagers

1. What kind of right do you have in this area?

Probing questions

1a. How long have you had that right?

1b. How did you get it?

2. What is your main economic activity?

Probing questions

2a. Do you have other income-generating activities within your family?

2b. What is your average monthly income now (TZS)?

2c. What about five years ago?

2d. What do your livelihood depend on?

3. Do you access SANAPA?

Probing questions

3a. Are you aware of the restrictions to enter the park without authorization?

3b. Why do you access the park?

3c. How often do you access the park?

3d. Do you have an alternative place?

3e. What does happen when somebody is caught inside the park by a park ranger?

4. How was SANAPA established?

Probing questions

4a. Did you know about TANAPA before the establishment of the park?

4b. What has been the approach of this organization?

4c. How did you know about the establishment of the park?

4d. What do you think about the park? Why do you have this opinion?

5. Have the park had any significant effect in your life or in your community?

Probing questions

5a. Could you mention how it was? Which negatives? Which positives?

5b. (For the negative impacts) How had you deal with them? Have you been compensated somehow?

5c. Has the park brought tourism? Do you get any revenues from the park?

5d. What about employment?

6. Do you know the boundary of your community? What about the boundary of the park?

7. What were your expectative about the establishment of SANAPA? What is your expectative now?

Probing questions

7a. What would you like to be done? What would you like to be changed?

8. Is there anything you would like to add and that we have not discussed yet?

A2: TANAPA Officers (*Intended questions to be asked)*

1. How is the agency organised?

Probing questions

1a. What are the main activities of the organization?

1b. What are the goals of the organization?

1c. Who does lead the organization? How?

1d. What are the main achievements of the organization?

2. How was SANAPA established?

Probing questions

2a. What were the reasons to update SGR into SANAPA?

2b. Were local villagers informed about it? When did that happen? Before of after the establishment of SANAPA? If after: why?, How was the process?

2c. What was the approach taken with those people holding rights in the area declared as a national park?

2d. Do you know the boundaries of the park? How were the boundaries of the park defined? Have local communities being told about it?

3. What have changed after the establishment of SANAPA?

Probing questions

3a. What is the status of the ecosystem? Did it improve? How did it improve?

3b. Do tourists come to visit the park?

4. What are the issues that are currently challenging more your organization regarding SANAPA?

Probing questions

4a. What are the main problems of SANAPA?

4b. How do you deal with them?

4c. Were affected people by the establishment of the park compensated? If yes, how?; If no, why not?

4d. Does TANAPA interact with local villagers somehow? If yes, how?

4e. How would you describe the relationship between TANAPA and local villagers?

4f. What is your personal experience regarding this relationship?

4g. In your opinion what are the reasons for the conflicts experienced?

5. How is invested the money TANAPA collects with the entrance fee to the park?

Probing questions

5a. Do local communities receive any revenues from the park? If yes, how? If no, why not?

5b. Does TANAPA invest in local communities? If yes, how? If no, why not?

5c. Are the employees from the local communities surrounding the park?

A3: Bagamoyo Land Officer

1. How can anyone have access to land in the district of Bagamoyo? What is the process?
2. Are all allocated rights registered? If yes, how? If no, why not?
3. Were the area declared as a game reserve registered? If is the park registered? If not, why not?
4. What can you tell me about the establishment of SADANI and the rights of local villagers?

Probing questions

4a. Were rights of local people extinguished?

4b. Do you know how many of them were registered?

4c. How was the process?

5. Do you know the boundaries of the park?

Probing questions

5a. Is there any official document where the boundary of the park is described? If yes, can I have a look at it?

5b. How was the survey carried out?

6. Is there anything you consider relevant for my research and that you would like to add?

A4: Ministry of Natural Resources and Tourism / Wildlife Division Officers

1. How is the organization structured?

Probing questions

1a. What are the main activities of the organization?

1b. What are the goals of the organization?

1c. What are the main achievements of the organization?

2. Inside an area declared as a game reserve, what is allowed and what is not allow doing?
3. How was Saadani Ecosystem declared as a game reserve?

Probing questions

3a. What were the main effects on rights of local communities?

3b. Were people compensated? What does the legislation say about it?

3c. What was the approach of the organization concerning those affected people?

4. What did change when Saadani was upgraded from game reserve to national park?

Probing questions

4a. How was the upgrading process done?

4b. In your opinion what could have not been done better? Why?

4c. What could have been done better? Why? How?

5. Is there anything you consider relevant for my research and that you would like to add?

A5: Researchers

1. What do you know about the establishment of SANAPA?

Probing questions

1a. How was the upgrading process from game reserve to national park in Saadani done?

1b. Was really needed such an upgrade? Why?

2. In your opinion what have been the main effects caused by the establishment of the park?

Probing questions

2a. In general, which have been the positive effects? And negatives effects?

2b. Which have been the effects in local communities? Effects in the Ecosystem?

3. In your opinion what are the roots of the conflicts?

Probing questions

3a. What could have been done better?

3b. What do you think would have been the right way to do it?

3c. What do you think are the drivers of the situation faced in SANAPA?

4. What would you suggest to be done?

5. Is there anything you consider relevant for my research and that you would like to add?

Appendix B: Summary of interviews and observations

B1: Interviews and Observations for Villagers

Location: Saadani village in Bagamoyo district, Uvinje and Buyuni villages in Pangani distric

Date: October 20 and 21, 2009

Interviewee	***Findings***
	Rights
Saadani villagers	45% of the respondents expressed they own the land they dwell in, while 55% said they were granted with rights of occupancy. Those who are living there for long time ago inherited those rights from their parents. People who hold rights of occupancy got it from village council and from individuals as well.
Uvinje and Buyuni villagers	They own the land on which they dwell. They inherited it from their parents and those did it from their parents as well. They all were born there.
	Economic Activities
All Villagers	Respondents word frequency: Fishing 8 Crops 6 Livestock keeping 5 Small business 3 Current average monthly income: < 50,000 Tsh: 53% 50,000 – 100,00 Tsh: 37% > 100,000 Tsh: 11% Changes in incomes associated with the park: 32% reported an increase 21% reported a decrease 47% do not see changes
	Access to SANAPA
Saadani villagers	They enter to the park even knowing they are not allowed to do it. They have no more options. They go inside looking for water, timber, firewood. When they are caught by TANAPA rangers, they are taken to TANAPA office and told not to do it again. Their tools, buckets and whatever they took from the park, is all confiscated.
Uvinje and Buyuni villagers	They mostly do not cross the boundary of the park, inside their village they have the resources they need.
	Establishment of SANAPA
Saadani Villagers	They knew about the establishment of the park, some elders were invited and all villagers approved it, but soon they realised they lost many of their land. Now both the boundary of the park and the boundary of their village is unknown by them.

Interviewee	*Findings*
	The opinion about the park was diverse: 55 % of the respondents expressed their complacence with the idea of the park, while 45% of the respondents were not happy at all. Those who approved the idea of the park expressed that the park has bought some benefits for the village. The villagers resettled in Saadani told us that some TANAPA staff made an inventory of their houses, crops and what they build and without warning and more explanations they got some compensation and the indication to move away.
Uvinje villagers	They knew about the establishment of SANAPA before hand. They were told by TANAPA staff to move away, the District Council told them to stay. They consider that the park helps to protect some animals, therefore is good the idea of its establishment. They want to preserve wildlife. They know the boundary of their village; the rest is part of SANAPA, they do not know all the boundary of the park.
Buyuni villagers	They listened about the park from the radio. Some regional leaders were invited to a meeting with TANAPA staff, but they were not informed about it. They came to know later that their area is now a national park. They like the park, because is for the benefit of the Ecosystem, as they expressed. However, they do not know the boundary of their village, neither the boundary of the park.
Effects	
Saadani Villagers	Among the villagers in Saadani that expressed their non-conformity with the park are those that were resettled. For them, all what the park have brought for them are negative effects: they lost their crops, their houses and as they also said they lost all they traditionally owned. They used to access many resources that now they cannot. All of them expressed desire to go back because they know they are just losing money and getting nothing. Most of them also expressed they raised formal complains but none of them worked. On the other hand, in the same village I talked with people who think that the park has brought also positive effects, but without ignoring the disadvantages of the park. They mentioned some benefits like the school, infrastructure, training to live with wildlife, equipment for the nursery and free rides to the hospital in emergency cases and to churches in some especial occasions. They said that economic activities in the village are limited and they do not like it. Their life conditions were better in their previous place is what all villagers that had to left their places and moved to Saadani said. And they also said that together with them more than 7 families were moved from their place.
Uvinje villagers	They complaint about that when the area was a game reserve the administration used to take and place somewhere else the animals when those destroy their crops. But now animals are everywhere. They used to have coconuts trees, maize, cassava and potatoes, but they were all destroyed. TANAPA does not help them according to their opinion. They cannot go to

Interviewee	***Findings***
	the park and take the resources they need.
Buyuni villagers	They cannot hunt, they cannot walk with knives or matches inside the park, they cannot cut trees. Animals destroy their trees and their plantations. They do not cultivate anymore. Now they use the trees inside their village.
Expectative	
Saadani Villagers	For the villagers in general their original expectation was that the park would increase the protection of wildlife without imposing so many restrictions to them. They also expected some employment and revenues from TANAPA. For the villagers that voluntary moved to Saadani looking for opportunities, their expectation was high tourism and development of the community. However, they expressed their disappointment about those issues. For the villagers resettled they expect one day to be allowed to go back. Meanwhile they want to see the support of the government.
Uvinje villagers	They thought the park would bring a lot of benefits, but it did not. They consider that they have been disturbed and they are not being helped.
Buyuni villagers	These villagers also expressed the expectations they had about tourism in the area, improvement of infrastructure and employment. Because the park took their cultivation area now they would like to be given education on fishing and loans to build better their houses.
Free comments	
Saadani Villagers	Villagers that have been living in Saadani consider that the restrictions imposed are unnecessary. They have been living with animals all their life, and they never did something against them. Moreover, the initiative to establish SGR came from them. In general they agree in saying that TANAPA does not involve them at all.
Uvinje villagers	They added that national parks should not be established at the expense of poor villagers.
Buyuni villagers	They considered that what was wrong was not the establishment of the park but the approach taken by TANAPA.
Observations	
Saadani Villagers	In Saadani village is very evident the relation wildlife-people. Animals like monkeys and warthogs are everywhere in the village. I saw many of the monkeys stole food from many houses. There is no demarcation indicating the boundary of the park and the boundary of the village. In two days that I spent in that village just 2 small groups of tourists were observed. Also according to the expressed by local people tourism in the park is quite low. Regarding those villagers that had to move, it is very obvious the feeling of frustration and irritation about what happened to them.

Interviewee	*Findings*
	All villagers in Saadani willingly spent their time to answer my questions, which in some cases took more than two hours.
Uvinje villagers	Uvinge village is a very small village located approximately 20 minutes South of Saasani driving on a minor road. It is a village that is just inside the park. As soon as we reached the village, the local leader approached us gently about the reason of our presence there. And after being told by the interpreter the reason of our presence, he agreed to talk with us without any problem. He invited to his house and started answering the questions. Some villagers came to see what was happening and I took the chance to talk with them as well. In general they all share the same feelings and perceptions about the park. They all also looked very spontaneous while replying to my questions.
Buyuni villagers	Buyuni is another small settlement inside the park and close to Saadani, that was desegregated from Buyuni Kitopeni in a river flood a couple of years ago. The interviews were carried out in a small cafeteria where local people, including the local leader, were having breakfast. As villagers from Uvinje, villagers from Buyuni looked quite spontaneous, sincere and also very sensitive about TANAPA administration of the park. .

B2: Interviews and Observations for Officers

Location: Dar es Salaam and Bagamoyo district

Date: October 7, 8 and 9, 2009

Interviewee: Land Officer Bagamoyo

Facts: The interview with the land officer in Bagamoyo was carried out following the semi-structured questionnaire included in Appendix A3.

Opinion: Regarding the issue of access to land, the land officer of Bagamoyo referred to the NLP and stated that any citizen can get allocated a piece of land not only in Bagamoyo but in all the country through the authorized officers. The procedures for rights of occupancy are included in the Land Act of 1999. He also said that it is not possible to register all rights that are allocated because of the existence of traditional rights, adding that in the same way none of the protected areas are registered.

Regarding the establishment of SADANI, he indicated that TANAPA is the organization in charge of it and as such it is the most indicated to provide the relevant information, instead of him. He argued that the existence of many traditional and thus unregistered rights makes ‘very hard’ to track the rights that were in the area before the establishment, those that were extinguished or those that still exist. Additionally the public bodies in charge of the protected areas have also jurisdiction in the issue.

Observations: The officer seemed a bit uncomfortable with the interview, but he was kind all the time we stayed there. He expressed that to help me, he needed to devote a lot of time looking for the information I needed and that could not be possible because of the amount of work he had to do. However, he was quite helpful in offering himself to prepare the letters of introduction for me to talk with the local leaders in the area around SANAPA and in jurisdiction of Bagamoyo district.

Location: Dar es Salaam

Date: October 8 and 9, 2009

Interviewee: Wildlife Division/Ministry of Natural Resources and Tourism officer

Facts: The interview with an officer from the wildlife Division was carried out following the semi-structured questionnaire included in Appendix A4.

Opinion: Wildlife Division is a separated agency from the Ministry of Wildlife of Natural Resources and Tourism that is in charge of the management of wildlife in areas that are not declared national parks. The officer told me that the Division has implemented several projects (community-based natural resource management programs) aiming at reducing wildlife-human conflicts and allowing communities to be benefited with the implementation of protected areas, basically in game reserves with international cooperation.

He explained that the president is in charge of declaring game reserves areas. Rights of residence, ranching and farming are allowed with certain conditions. Hunting, tree cutting or burning are activities restricted under permission of the respective director.

Regarding the issue of the establishment of SGR, he told us that after the Arusha Manifesto of 1961, when the first president of Tanzania highlighted the relevance of wildlife in Tanzania, it started the concern of the government and people in general as well, about wildlife. A couple of years later and initiated with a request of own local people, SGR was gazetted. Such declaration was done in agreement with local communities; therefore, it did not represent a threat for their livelihoods and their community in general. With no expropriation, there was no compensation paid. He also argues that the boundaries of the game were clearly established and known for the community. Once the area was declared as a national park, Wildlife Division did not have more jurisdictions over it, and TANAPA assumed the administration of it. His comments about the process of establishment of TANAPA were not detailed and limited to the opinion that the process should have had more involvement of local communities.

Observations: Answers given were very relaxed and spontaneous. The person interviewed in the Division seems to be very familiar with the subject of the interview. By the statements of the respondent, it look as if TANAPA and Wildlife Division do not cooperate together in the implementation of projects in benefit of communities neighbouring wildlife, but on the contrary they do disagree on approaches and procedures.

B3: Interviews and Observations for Researchers

Location: University of Dar es Salaam

Date: October 19 and 22, 2009

Facts: The interviews with researchers from IRA in University of Dar es Salaam were carried out following the semi-structured questionnaire included in Appendix A5. One of them suggested an assessment.

Opinion: Concerning the establishment of the park, both agree in the establishment. However, they suggest the promotion of channels of communication and alliances between environmental authorities and local communities to protect the Environmental without impoverishment of local communities, but support and improvement of livelihoods.

They expressed that national parks are good in the sense that generate revenues from tourism and increase environmental protection, however, local communities are highly dependant on land and natural resources and park authorities tend to overlook that. According to them, the problem is not the legislation; they referred to the some environmental laws and the policies guiding environmental administration in Tanzania, arguing that the main problems are the organizations more than the institutions. Talking about the issue of compensation, it was concluded that the value is set by government assessors in most of the cases without being in accordance with the principles established for that, e.g. payments of interest in case of delay. Another issues that bring conflicts about it, is the restrictions of payment of compensation for developed areas, however, there is no clear and unified definition of what is consider developed to get compensation for it. The transport allowance, which should be included in the compensation payment, is restricted to a distance of 20 kilometres.

Observations: Both interviewees appeared vey knowledgeable about the Saadani Ecosystem, giving a lot of details about it. They also provided hints to get secondary data to somehow act for the data that was not feasible to collect; that includes also facilitation to access University of Dar es Salaam's library.

B4: List of interviewees

Interviewees		***Sample size***
Local people	Buyuni local leader	1
	Buyuni group of villagers	3
	Saadani Village local leader	1
	Saadani random villagers	9
	Uvinje local leader	1
	Uvinje group of villagers	4
Officers	Bagamoyo land officer	1
	Wildlife Division	1
Researchers	IRA – Dar es Salaam University	2

Appendix C: Cases analysed in DANA

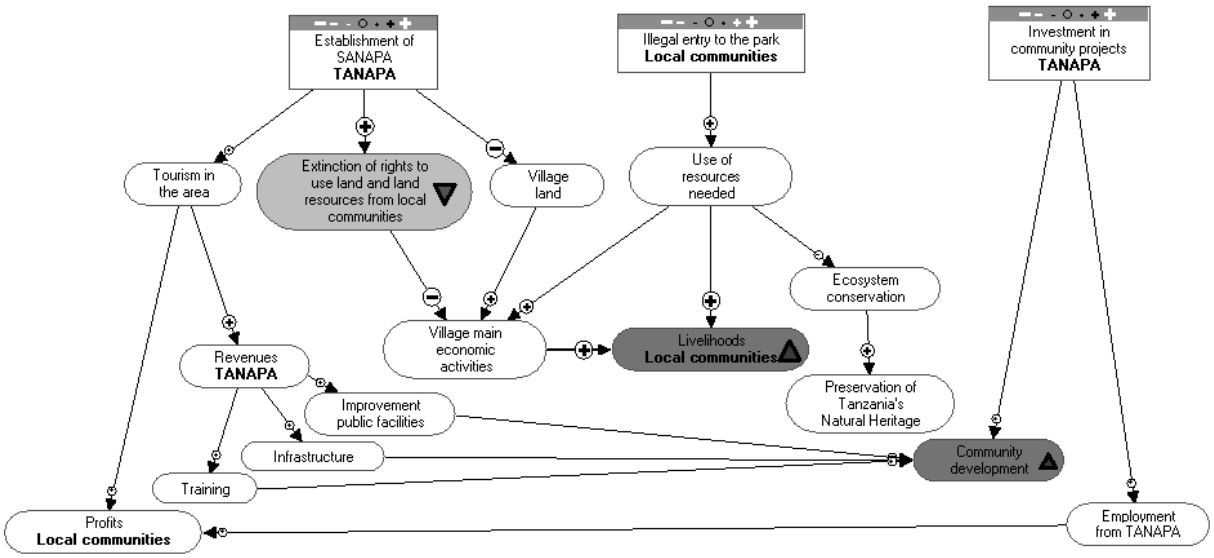
C1: Analysis 1

Interaction SANAPA - local villagers

Local communities

Tanzania National Park

Perception of ***Local communities***

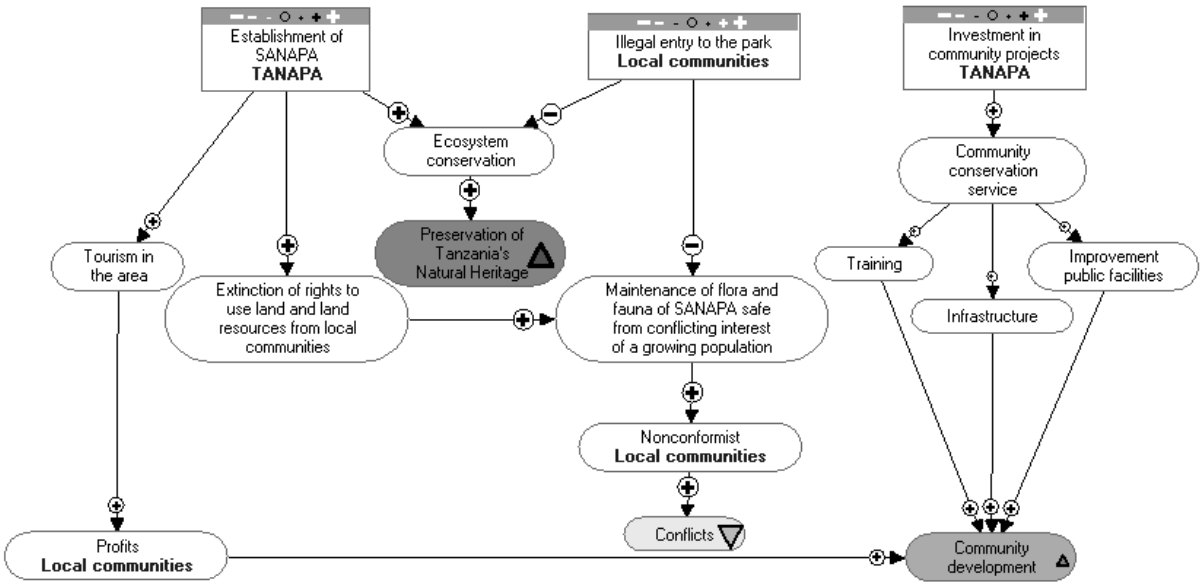


Factor	*Goal*	*Action range*
ADD Community development	▲	
ADD Ecosystem conservation		
ADD Employment from TANAPA		
ADD Establishment of SANAPA ***[TANAPA]***		− − - ○ + +
ADD Extinction of rights to use land and land resources from local communities	▼	
ADD Illegal entry to the park ***[Local communities]***		− − - ○ + +
ADD Improvement public facilities		
ADD Infrastructure		
ADD Investment in community projects ***[TANAPA]***		− − - ○ + +
ADD Livelihoods ***[Local communities]***	▲	
ADD Preservation of Tanzania's Natural Heritage		
ADD Profits ***[Local communities]***		
ADD Revenues ***[TANAPA]***		
ADD Tourism in the area		
ADD Training		
ADD Use of resources needed		
ADD Village land		
ADD Village main economic activities		

Causal links

- Ecosystem conservation
- Employment from TANAPA
- Establishment of SANAPA ***[TANAPA]***
- Establishment of SANAPA ***[TANAPA]***
- Establishment of SANAPA ***[TANAPA]***
- Extinction of rights to use land and land resources from local communities
- Illegal entry to the park ***[Local communities]***
- Improvement public facilities
- Infrastructure
- Investment in community projects ***[TANAPA]***
- Investment in community projects ***[TANAPA]***
- Revenues ***[TANAPA]***
- Revenues ***[TANAPA]***
- Revenues ***[TANAPA]***
- Tourism in the area
- Tourism in the area
- Training
- Use of resources needed
- Use of resources needed
- Use of resources needed
- Village land
- Village main economic activities
- Preservation of Tanzania's Natural Heritage
- Profits ***[Local communities]***
- Extinction of rights to use land and land resources from local communities
- Tourism in the area
- Village land
- Village main economic activities
- Use of resources needed
- Community development
- Community development
- Community development
- Employment from TANAPA
- Improvement public facilities
- Infrastructure
- Training
- Profits ***[Local communities]***
- Revenues ***[TANAPA]***
- Community development
- Ecosystem conservation
- Livelihoods ***[Local communities]***
- Village main economic activities
- Village main economic activities
- Livelihoods ***[Local communities]***

Perception of ***Tanzania National Park***



Factor		***Goal***	***Action range***
ADD	Community conservation service		
ADD	Community development		
ADD	Conflicts		
ADD	Ecosystem conservation		
ADD	Establishment of SANAPA ***[TANAPA]***		
ADD	Extinction of rights to use land and land resources from local communities		
ADD	Illegal entry to the park ***[Local communities]***		
ADD	Improvement public facilities		
ADD	Infrastructure		
ADD	Investment in community projects ***[TANAPA]***		
ADD	Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population		
ADD	Nonconformist ***[Local communities]***		
ADD	Preservation of Tanzania's Natural Heritage		
ADD	Profits ***[Local communities]***		
ADD	Tourism in the area		
ADD	Training		

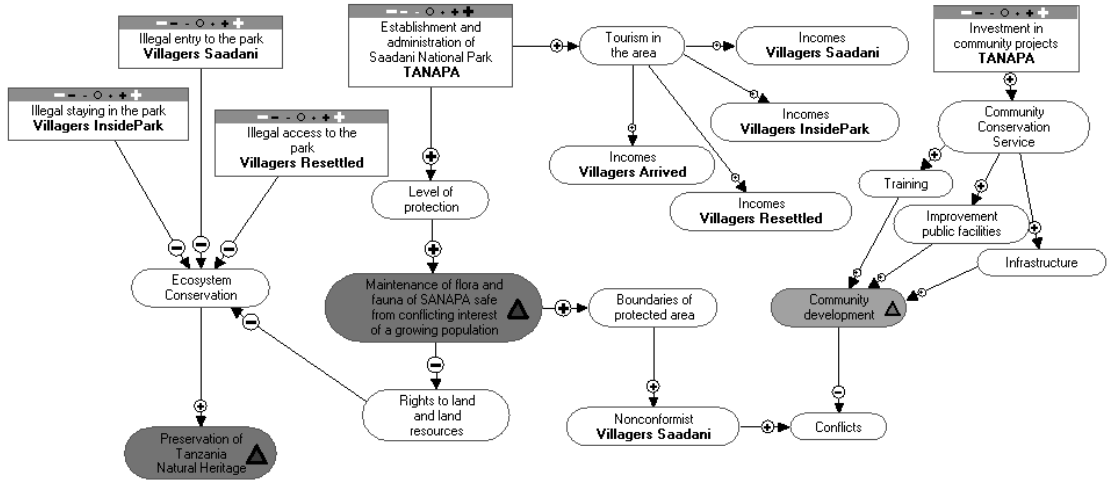
Causal links

Community conservation service	Improvement public facilities
Community conservation service	Infrastructure
Community conservation service	Training
Ecosystem conservation	Preservation of Tanzania's Natural Heritage
Establishment of SANAPA ***[TANAPA]***	Ecosystem conservation
Establishment of SANAPA ***[TANAPA]***	Extinction of rights to use land and land resources from local communities
Establishment of SANAPA ***[TANAPA]***	Tourism in the area
Extinction of rights to use land and land resources from local communities	Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population
Illegal entry to the park ***[Local communities]***	Ecosystem conservation
Illegal entry to the park ***[Local communities]***	Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population
Improvement public facilities	Community development
Infrastructure	Community development
Investment in community projects ***[TANAPA]***	Community conservation service
Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population	Nonconformist ***[Local communities]***
Nonconformist ***[Local communities]***	Conflicts
Profits ***[Local communities]***	Community development
Tourism in the area	Profits ***[Local communities]***
Training	Community development

C2: Analysis 2

- Tanzania National Park
- Villagers_Saadani
- Villagers_InsidePark
- Villagers_Resettled
- Villagers_Arrived

Perception of ***Tanzania National Park***



Factor		*Goal*	*Action range*
ADD	Boundaries of protected area		
ADD	Community Conservation Service		
ADD	Community development	△	
ADD	Conflicts		
ADD	Ecosystem Conservation		
ADD	Establishment and administration of Saadani National Park ***[TANAPA]***		− − - ○ + + ✚
ADD	Illegal access to the park ***[Villagers Resettled]***		− − - ○ + + ✚
ADD	Illegal entry to the park ***[Villagers Saadani]***		− − - ○ + + ✚
ADD	Illegal staying in the park ***[Villagers InsidePark]***		− − - ○ + + ✚
ADD	Improvement public facilities		
ADD	Incomes ***[Villagers Arrived]***		
ADD	Incomes ***[Villagers InsidePark]***		
ADD	Incomes ***[Villagers Resettled]***		
ADD	Incomes ***[Villagers Saadani]***		
ADD	Infrastructure		
ADD	Investment in community projects ***[TANAPA]***		− − - ○ + + ✚
ADD	Level of protection		
ADD	Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population	△	
ADD	Nonconformist ***[Villagers Saadani]***		
ADD	Preservation of Tanzania Natural Heritage	△	

ADD Rights to land and land resources

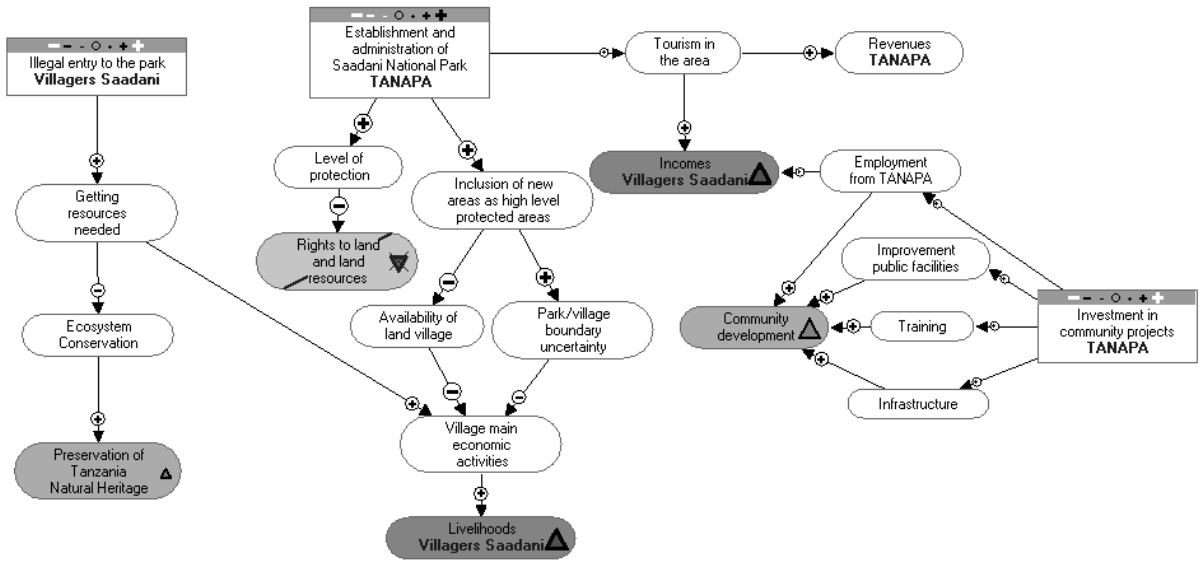
ADD Tourism in the area

ADD Training

Causal links

Boundaries of protected area	Nonconformist ***[Villagers Saadani]***
Community Conservation Service	Improvement public facilities
Community Conservation Service	Infrastructure
Community Conservation Service	Training
Community development	Conflicts
Ecosystem Conservation	Preservation of Tanzania Natural Heritage
Establishment and administration of Saadani National Park ***[TANAPA]***	Level of protection
Establishment and administration of Saadani National Park ***[TANAPA]***	Tourism in the area
Illegal access to the park ***[Villagers Resettled]***	Ecosystem Conservation
Illegal entry to the park ***[Villagers Saadani]***	Ecosystem Conservation
Illegal staying in the park ***[Villagers InsidePark]***	Ecosystem Conservation
Improvement public facilities	Community development
Infrastructure	Community development
Investment in community projects ***[TANAPA]***	Community Conservation Service
Level of protection	Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population
Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population	Boundaries of protected area
Maintenance of flora and fauna of SANAPA safe from conflicting interest of a growing population	Rights to land and land resources
Nonconformist ***[Villagers Saadani]***	Conflicts
Rights to land and land resources	Ecosystem Conservation
Tourism in the area	Incomes ***[Villagers Arrived]***
Tourism in the area	Incomes ***[Villagers InsidePark]***
Tourism in the area	Incomes ***[Villagers Resettled]***
Tourism in the area	Incomes ***[Villagers Saadani]***
Training	Community development

Perception of ***Villagers_Saadani***



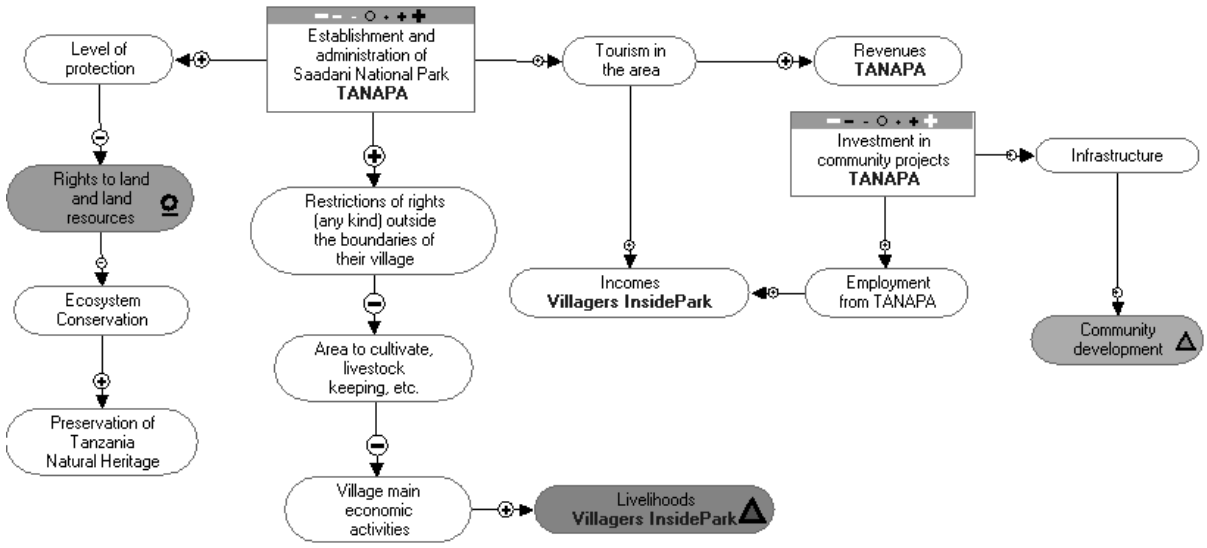
Factor	***Goal***	***Action range***
ADD Availability of land village		
ADD Community development	△	
ADD Ecosystem Conservation		
ADD Employment from TANAPA		
ADD Establishment and administration of Saadani National Park ***[TANAPA]***		− − - ○ + + ✚
ADD Getting resources needed		
ADD Illegal entry to the park ***[Villagers Saadani]***		− − - ○ + + ✚
ADD Improvement public facilities		
ADD Inclusion of new areas as high level protected areas		
ADD Incomes ***[Villagers Saadani]***	△	
ADD Infrastructure		
ADD Investment in community projects ***[TANAPA]***		− − - ○ + + ✚
ADD Level of protection		
ADD Livelihoods ***[Villagers Saadani]***	△	
ADD Park/village boundary uncertainty		
ADD Preservation of Tanzania Natural Heritage	△	
ADD Revenues ***[TANAPA]***		
ADD Rights to land and land resources	▽	
ADD Tourism in the area		
ADD Training		
ADD Village main economic activities		

Causal links

- Availability of land village
- Ecosystem Conservation
- Employment from TANAPA
- ⊖ Village main economic activities
- ⊕ Preservation of Tanzania Natural Heritage
- ⊕ Community development

- Employment from TANAPA
- Establishment and administration of Saadani National Park *[TANAPA]*
- Establishment and administration of Saadani National Park *[TANAPA]*
- Establishment and administration of Saadani National Park *[TANAPA]*
- Getting resources needed
- Getting resources needed
- Illegal entry to the park *[Villagers Saadani]*
- Improvement public facilities
- Inclusion of new areas as high level protected areas
- Inclusion of new areas as high level protected areas
- Infrastructure
- Investment in community projects *[TANAPA]*
- Investment in community projects *[TANAPA]*
- Investment in community projects *[TANAPA]*
- Investment in community projects *[TANAPA]*
- Level of protection
- Park/village boundary uncertainty
- Tourism in the area
- Tourism in the area
- Training
- Village main economic activities
- Incomes *[Villagers Saadani]*
- Inclusion of new areas as high level protected areas
- Level of protection
- Tourism in the area
- Ecosystem Conservation
- Village main economic activities
- Getting resources needed
- Community development
- Availability of land village
- Park/village boundary uncertainty
- Community development
- Employment from TANAPA
- Improvement public facilities
- Infrastructure
- Training
- Rights to land and land resources
- Village main economic activities
- Incomes *[Villagers Saadani]*
- Revenues *[TANAPA]*
- Community development
- Livelihoods *[Villagers Saadani]*

Perception of ***Villagers_InsidePark***

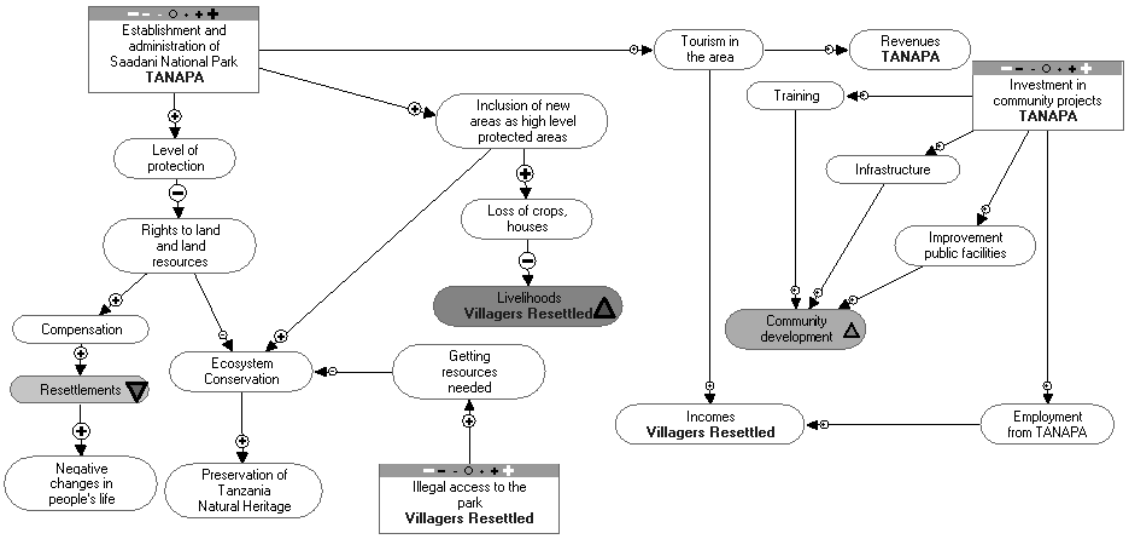


Factor	*Goal*	*Action range*
ADD Area to cultivate, livestock keeping, etc.		
ADD Community development		
ADD Ecosystem Conservation		
ADD Employment from TANAPA		
ADD Establishment and administration of Saadani National Park ***[TANAPA]***		
ADD Incomes ***[Villagers InsidePark]***		
ADD Infrastructure		
ADD Investment in community projects ***[TANAPA]***		
ADD Level of protection		
ADD Livelihoods ***[Villagers InsidePark]***		
ADD Preservation of Tanzania Natural Heritage		
ADD Restrictions of rights (any kind)c outside the boundaries of their village		
ADD Revenues ***[TANAPA]***		
ADD Rights to land and land resources		
ADD Tourism in the area		
ADD Village main economic activities		

Causal links

Area to cultivate, livestock keeping, etc.	Village main economic activities
Ecosystem Conservation	Preservation of Tanzania Natural Heritage
Employment from TANAPA	Incomes [Villagers InsidePark]
Establishment and administration of Saadani National Park [TANAPA]	Level of protection
Establishment and administration of Saadani National Park [TANAPA]	Restrictions of rights (any kind) outside the boundaries of their village
Establishment and administration of Saadani National Park [TANAPA]	Tourism in the area
Infrastructure	Community development
Investment in community projects [TANAPA]	Employment from TANAPA
Investment in community projects [TANAPA]	Infrastructure
Level of protection	Rights to land and land resources
Restrictions of rights (any kind) outside the boundaries of their village	Area to cultivate, livestock keeping, etc.
Rights to land and land resources	Ecosystem Conservation
Tourism in the area	Incomes [Villagers InsidePark]
Tourism in the area	Revenues [TANAPA]
Village main economic activities	Livelihoods [Villagers InsidePark]

Perception of ***Villagers_Resettled***



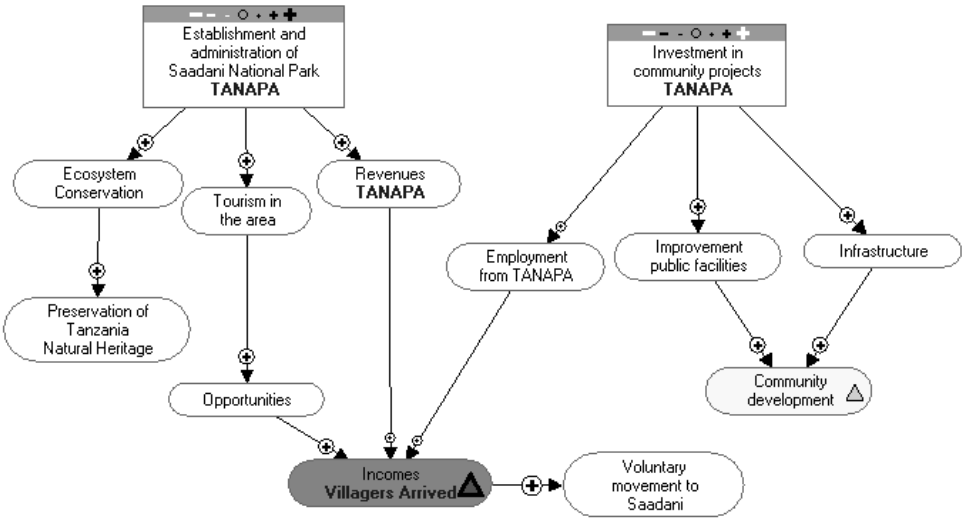
Factor	***Goal***	***Action range***
ADD Community development	▲	
ADD Compensation		
ADD Ecosystem Conservation		
ADD Employment from TANAPA		
ADD Establishment and administration of Saadani National Park ***[TANAPA]***		− − · ○ + + ✚
ADD Getting resources needed		
ADD Illegal access to the park ***[Villagers Resettled]***		− − · ○ + + ✚
ADD Improvement public facilities		
ADD Inclusion of new areas as high level protected areas		
ADD Incomes ***[Villagers Resettled]***		
ADD Infrastructure		
ADD Investment in community projects ***[TANAPA]***		− − · ○ + + ✚
ADD Level of protection		
ADD Livelihoods ***[Villagers Resettled]***	▲	
ADD Loss of crops, houses		
ADD Negative changes in people's life		
ADD Preservation of Tanzania Natural Heritage		
ADD Resettlements	▽	
ADD Revenues ***[TANAPA]***		
ADD Rights to land and land resources		
ADD Tourism in the area		
ADD Training		

Causal links

- Compensation
- Ecosystem Conservation
- Employment from TANAPA
- Establishment and administration of Saadani National Park ***[TANAPA]***
- Resettlements
- Preservation of Tanzania Natural Heritage
- Incomes ***[Villagers Resettled]***
- Inclusion of new areas as high level protected areas

- Establishment and administration of Saadani National Park ***[TANAPA]***
- Establishment and administration of Saadani National Park ***[TANAPA]***
- Getting resources needed
- Illegal access to the park ***[Villagers Resettled]***
- Improvement public facilities
- Inclusion of new areas as high level protected areas
- Inclusion of new areas as high level protected areas
- Infrastructure
- Investment in community projects ***[TANAPA]***
- Investment in community projects ***[TANAPA]***
- Investment in community projects ***[TANAPA]***
- Investment in community projects ***[TANAPA]***
- Level of protection
- Loss of crops, houses
- Resettlements
- Rights to land and land resources
- Rights to land and land resources
- Tourism in the area
- Tourism in the area
- Training
- Level of protection
- Tourism in the area
- Ecosystem Conservation
- Getting resources needed
- Community development
- Ecosystem Conservation
- Loss of crops, houses
- Community development
- Employment from TANAPA
- Improvement public facilities
- Infrastructure
- Training
- Rights to land and land resources
- Livelihoods ***[Villagers Resettled]***
- Negative changes in people's life
- Compensation
- Ecosystem Conservation
- Incomes ***[Villagers Resettled]***
- Revenues ***[TANAPA]***
- Community development

Perception of ***Villagers_Arrived***



Factor	***Goal***	***Action range***
ADD Community development	△	
ADD Ecosystem Conservation		
ADD Employment from TANAPA		
ADD Establishment and administration of Saadani National Park ***[TANAPA]***		
ADD Improvement public facilities		

Causal links

- Ecosystem Conservation → Preservation of Tanzania Natural Heritage
- Employment from TANAPA → Incomes *[Villagers Arrived]*
- Establishment and administration of Saadani National Park *[TANAPA]* → Ecosystem Conservation
- Establishment and administration of Saadani National Park *[TANAPA]* → Revenues *[TANAPA]*
- Establishment and administration of Saadani National Park *[TANAPA]* → Tourism in the area
- Improvement public facilities → Community development
- Incomes *[Villagers Arrived]* → Voluntary movement to Saadani
- Infrastructure → Community development
- Investment in community projects *[TANAPA]* → Employment from TANAPA
- Investment in community projects *[TANAPA]* → Improvement public facilities
- Investment in community projects *[TANAPA]* → Infrastructure
- Opportunities → Incomes *[Villagers Arrived]*
- Revenues *[TANAPA]* → Incomes *[Villagers Arrived]*
- Tourism in the area → Opportunities