



CTM Centre for Transdisciplinary Environmental Research
STOCKHOLM UNIVERSITY



ECOSYSTEM MANAGEMENT UNDER STRESSED CONDITIONS

*THE RISE AND FALL OF ECOSYSTEM MANAGEMENT IN A WETLAND
LANDSCAPE OF THE CENTRAL GAZA STRIP*

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**Natural Resource Management,
Governance and Globalisation
Master's Thesis 2007:7**

Ecosystem management under stressed conditions: The raise and fall of ecosystem management in a wetland landscape of the central Gaza Strip.

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It is with great fear on all levels I receive the returning reports on the alarming situation in the Gaza Strip, plagued by internal conflicts and persistent Israeli intimidations. In this light a natural park is nothing. However, yet another unproductive ecosystem in one of the most crowded places on earth, may in a near future put the people in Gaza in front of an even greater adversary than the occupation alone.

Nils Johansson

Stockholm, 27 May 2007

Abstract

This paper investigates the rise and fall of an organisational structure for a wetland landscape in the central Gaza Strip. This process through the jointly efforts of several stakeholders initiated a novel direction but ended up in a polarized collapse. By interviewing individuals highly involved in the management process, this thesis identifies critical factors for the rise and fall of the organizational structure in Wadi Gaza, with the aim to deepen our understanding of transformability.

In response to an ecological crisis, one individual played a significant role, by communicating the problem and a vision to other concerned individuals, which developed into a social network. The network brought innovation and the vision was soon formulated into an intertwined strategy; promoting social and ecological solutions hand in hand, which opened up a window of opportunity as the jointly social-ecological solutions attracted donors to fund the establishment of the national park.

However as soon as the project was about to be launched, the transformation of the organizational structure shifted from network guidance in to hierarchical management, excluding all other actors. In which there was no flow of information both horizontal from other stakeholder, because of polarization, and vertical within the management, due to lacking internal communication. Simultaneously, the area was highly depended on external support and funding which became frozen in response to the Palestinian uprising. These circumstances made the management incapable to respond and withstand external shocks to the social infrastructure and therefore led to the system collapsing.

If the social network and the key steward still had been present, the transformation of the social-ecological system in Wadi Gaza presumably would have taken a more novel direction. But these features can not be assumed. In this case, the key leader once involved in the project is prohibited to visit the area due to travel restrictions and the origin interests of the local people changed, focusing on more basic needs then conservation of nature due to the insecurity. This concludes that establishing self-organized management requires a healthy civic society under stability, not strained by social disorder or conflicts.

Thanks to the efforts of international and local agencies, Wadi Gaza will be saved, transformed into the first ever nature park for the Palestinian people.¹

¹ See: http://www.usaid.gov/wbg/story_0.htm lasted check 2007-05-24

Acronyms and Abbreviations

BMZ	German Federal Ministry for Economic Cooperation and Development
DANIDA	Danish Aid Agency
EQA	Environmental Quality Authority
IBA	Important Bird Area
MOPWH	Ministry of Public Works and Housing
MOPIC	Ministry of Planning and International Cooperation
MOAG	Ministry of Agriculture
MOTA	Ministry of Tourism and Antiquities
MOLG	Ministry of Local Government
NGO	Non-Governmental Organizations
PARC	Palestinian Agricultural Relief Committees
PNA	Palestinian National Authority
PWLS	Palestine Wildlife Society
SDC	The Swiss Agency for Development and Cooperation
USAID	United States Agency for International Development
UNDP/PAPP	United Nations Development Programme/ Programme of Assistance to the Palestinian People

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1. Introduction

The following chapter starts by introducing the reader to the case, the theoretical background and a clarification of concepts. Thereafter the chapter goes on to define the problem, empirical gaps in the theory and finally presents the research questions and the aim of the thesis.

Human well-being relies, irrespective of space and place, on the services supported by ecosystems (Millennium Ecosystem Assessment 2005). This is especially true in areas plagued by poverty; where poor people are to a greater extent dependent on local natural resources for their livelihood (WRI 2005). A major challenge in such areas is therefore to find ways to build, often in the face of scarce organizational resources, stable governance system that will secure the environmental productivity over a long time period (Costanza et al. 2000). To manage ecosystem sustainably requires an understanding of how to keep a system in a desirable productive state, i.e. resilient against potential changes and uncertainties (Gunderson and Holling 2002; Dietz et al. 2003; Folke et al. 2005; Lebel et al. 2006). A holistic approach becomes necessary, with a focus not only on the ecological conditions, which create narrow polices, but also on the dynamic links between the social system and the ecological system (Berkes and Folke 1998; Carpenter and Gunderson 2001).

The approach receiving a lot of scientific acknowledgement concerns a multidisciplinary adaptive approach, which stresses knowledge of complex social-ecological interactions in order to understand how to shape resilient social-ecological systems prepared for changes and surprises (Adger and Lutrell 2000; Berkes et al. 2003) capable of responding on ecosystem feedback at multiple scales (Folke et. al. 2003). It is capable of being adaptive because it acknowledges that new uncertainties will always emerge, surprises are inevitable, and ecosystems will always change as a result of human intervention (Gunderson 1999). The capacity to adapt to changes is a vital component of resilience (Berkes et al. 2003), an idea that can be traced to C. S. Holling's (1973) original work on ecological resilience and the discovery of multiple basins of attraction in ecosystems.

However, many of the case-studies that have informed the resilience theory on social-ecological systems are either from developed countries or from quite socially stable regions (e.g. Berkes et al. 2003; Olsson and Folke 2001; Olsson et al. 2004b; Tengö 2004; Gunderson et al. 2006; Olsson et al. 2006). In this thesis the possibilities and difficulties for adaptive management and governance in a socially unstable area with frequent armed conflicts are investigated through an explorative case-study in Wadi Gaza, the only coastal wetland in Palestine. The case displays the rise and fall of an organizational effort to manage a complex ecosystem intertwined with an unstable social system. Right after the declaration of Principles and the birth of the Palestine state in 1993, different pieces, as we will see, came together and opened a window of opportunity to create the first national park of Palestine. International funding fuelled an interesting strategy that sought to link international, national and local actors to solve ecological as well as social problems in the wetland. This process in its own right is interesting to study. However, with the advent of the al-Alqsa Intifada in 2000 things crumbled as Israel reacted and international donors stopped funding the project. A simple answer would be to blame the whole failure on the armed conflict, but here we will move beyond this explanation to find other factors from which to learn about the possibilities and constraints in building adaptive ecosystem management and governance in trouble-stricken areas as Palestine.

1.1 Resilience Theory

Resilience has been defined (Holling 1973; Folke et al. 2005) as the capacity of a system to withstand disturbances as well as to re-organise in face of uncertainty and greater change, while maintaining the same identity. Resilience is widely used in an ecological context related to slowly changing variables such as water level, habitat structures, nutrient levels and other longer-term factors (Gunderson et al. 2006). The ecological resilience is, however, closely linked to the human social sphere, while supporting a resilient ecological system is a function of successful ecosystem management (Hahn et al. 2006). The resilience in a *social-ecological system* is for that reason determined by both the ecological buffer capacity, and the adaptive capacity of human communities. The latter is known as *adaptability* (Walker et al 2006) and means to respond and shape external shocks so as to sustain the necessary ecosystem goods and services. A crucial over-arching question in this thesis is then how to organize a successful adaptive management under social disorder.

1.1.1 Adaptability

Ever since C. S. Holling (1973) introduced the concept of resilience in ecological systems a lot of work have been done in the field to expand the applicability of the concept. Resilience has found new ground and has become important in the growing understanding of how to manage and govern complex linked systems of nature and people (Folke et al. 2004). Following the work by Olsson et al. (2004a), Folke et al. (2005), and Gunderson et al. (2006) at least five components have been identified that enhance *adaptability*: One is creating opportunities for *self organization* (Berkes et al. 2003), i.e. a management organization with low dependence on external factors (Olsson et al 2004a), for instance with low need of continual investments (Ostrom 1999) and built upon actions coordinated in principal by voluntary organizations and individuals (Olsson et al 2004b). Another factor is fostering trust among stakeholders and resolving conflicts through *leadership* (Westley 2002; Olsson et al. 2004b) but also via, the third component, the development of *open and flexible epistemic networks* operating at different scales (Westley 2002; Folke et al. 2005), which connect different actors and facilitate sharing of management power and responsibility among all user-groups and stakeholders. The next component is a *physical infrastructure for discourse* where the network participants can meet and air ideas and problems (Olsson et al. 2004a; Hahn et al. 2006). The final component is *knowledge building* based on continuous testing and learning so as to monitor, interpret, and respond to ecosystem change (Gadgil et al. 1993; Berkes and Folke 1998; Westley 2002). This form of management, based broad collaboration and functional feedback loops between the social and ecological systems, is also referred to as adaptive co-management (Olsson et al. 2004a).

1.1.2 Transformability

The process that escorts the social-ecological system towards adaptive co-management and ecosystem management is often related to the concept of *transformability*. Walker with colleagues (2004) defines transformability as the capacity of the social domain to create a fundamentally new system where the existing political, social or ecological conditions make the system untenable. Based on the five components from above, transformability introduces a way of governing which will fundamentally change the structures and processes of a social-ecological system (Folke et al. 2005). It has been proposed that transformability, the transformation towards adaptive co-management and ecosystem management, emerges from two phases (Olsson et al 2004b; Olsson et al 2006); first a preparation phase, then a transition phase that establishes the new management. Olsson with colleagues (2006) argue that to start the transformation there is first of all a need for inspirational individuals' and informal

networks associated to the certain ecosystem area in focus. These individuals and networks are seen as necessary to highlight the extensive need of a new configuration, by identifying gaps of knowledge, creating nodes of expertise, developing strategies and visions as to make the system ready for transformation. However, to move from the preparation phase into the next phase, the transition, a window of opportunity and mobilization of economic resources are at many times critical (Olsson et al. 2004b; Olsson et al. 2006). Kingdon (1995) argues that vital changes are most likely to occur when “...a problem is recognized, a solution is available, the political climate makes the time right for change, and the constraints do not prohibit actions” i.e. when the problem, solutions and politics meet in a critical time. A window may open in many ways, by e.g. environmental crises or policy failures (Olsson et al. 2006), but without cross-scale interactions, involving meeting and bridging between organizations at multiple organizational levels (Westley 2002), the three different mechanisms can not convene. To link the different organizations, leadership is required that holds the potential to span scales, initiate partnerships, bring trust and solve conflicts among different actors (Berkes et al. 2003; Olsson et al. 2004b; Folke et al. 2005). The transition phase constitutes the final navigation towards adaptive co-management, which in turn makes resilience building possible. To take the final step, however, it is often necessary to modify the initial vision and plans developed during the preparation phase. These needs expanded to be with a diversity of alternative solutions and ways of action so as to meet uncertainty and changing conditions (Olsson et al. 2006) and establish the five components from above.

1.2 Problem definition

The concepts of adaptability and transformability have developed through theory developments as well as qualitative analysis and comparisons of a wide range of case studies. Danter with colleagues (2000) did an early work on the evolvement of organizational change as a component of adaptive management. Case studies of wetlands landscapes have mainly been used to emphasize the concepts, probably due to the dynamic characteristic of wetlands that have been difficult to manage successfully without an adaptive approach. Olsson et al. (2004b), Folke et al. (2005) and Hahn et al. (2006) have all analyzed the emergence of an adaptive co-management in a wetland landscape in southern Sweden. It is however clear that there is a gap in the broader social-ecological studies in wetlands plagued by social disorder. Hence, this paper seeks to deepen our understanding of adaptability and transformability by bringing the concepts to a wetland landscape in central Gaza Strip, an area under heavy stress from both internal and external conflicts. This case study concerns Wadi Gaza, an area that showed initially a lot of triggering efforts towards a new novel trajectory. This ambition will be referred to as ecosystem management, as it demonstrates similarities to attributes highlighted by the theory above.

The pre-studies mentioned above have exclusively elucidated social mechanisms behind successful transformations. Studies on unsuccessfully management have also been well covered, where researchers have tried to attribute the collapse to isolated factors; lack of effective institutions (Hardin 1968), inability to detect gradual change (Martin 1973, Alroy 2001), overexploitation (Clark 1973), social inequality (Blaikie and Brookfield 1987), command and control management (Holling and Meffe 1996) and lack of poverty rights (Adger and Lutrell 2000). This paper seeks to relate transformative social mechanisms with critical factors that might prevent the transformation towards ecosystem management. It thereby not only addresses the collapse of the reserve, which tends to isolate the explanation to single factors alone, but furthermore seeks to understand in particular why the transformation failed. The thesis will thus use a chronological approach, focusing on different phases the reserve has undergone, which should illuminate a further variety of explanatory

factors. Such an approach has received little attention but risen by Walker with colleagues (2006) as necessary for further development of the resilience theory. Olsson and colleagues (2006) have somewhat started this work by comparing five case studies, including cases demonstrating less successful transformation, but their main focus remains on critical factors crucial for transforming social-ecological systems. The thesis seeks to extend the resilience theory and clarify limits and possibilities to establish adaptive co-management in areas under heavy social stress.

1.3 Aim and research question

The aim of this thesis is to deepen our understanding of transformability and identify critical factors for the rise and fall of the organizational structure in Wadi Gaza. Simultaneously, the thesis seeks to highlight, on behalf of local and international conservationists, limits and possibilities of re-establishing a reserve in Wadi Gaza based on ecosystem management and ecological resilience.

In this light, the thesis will address the following questions;

- What factors in the preparation phase steered the organizational structure initially and made the establishment of the reserve possible?
- What factors in the transition phase prevented a further transformation and the implementation of ecosystem management in Wadi Gaza?

Based on the empirical findings a broader question will also be pursued:

- How can resilience in the social-ecological system of Wadi Gaza be enhanced?

2. The Case study

This chapter is meant to familiarize the reader with the area and provide crucial geographical, sociological and ecological background for the coming chapters.

2.1 Social and ecological features

Wadi Gaza is a wetland landscape in the central Gaza Strip within the Occupied Palestine Territory (as defined by UNRWA 2006). The “grandfathers of the Palestinians”, the Kan’ani people, who lived in the area from 2500 BC formed a kingdom under the name Besor (Eddabagh, 1985), a name that has been used in many verses in the bible². In recent times the area gained its importance being the only surface water resource in Gaza Strip as well as a natural landmark of Gaza. The area has also provided, besides the religious values, a variety of ecosystem services, including irrigation and fishing possibilities for human residing in the area. These have been under heavy stress lately (Atrash 2003, MedWetCoast 2003).

The study area is defined by political and hydrological borders, which comprise the wetland and the course of the river within Wadi Gaza plus adjacent in close relationship with the wetland under the jurisdiction of two municipalities, the Nuseirat and Bureij refugee camps in the south, and three local authorities: the village council of Wadi Gaza, AlZahra, and Al Mighraqa in the north (MedWetCoast, 2003; map of area in Annex A). Wadi Gaza with surrounding has a resident population of around 10,000 people, where nationals representing 45% of the total population, refugees about 51% and nomadic Bedouins 4% (ibid). People are in general very poor and the unemployment rate is estimated to 80% (UNDP 2002)

² For example Samuel 30, 9 that reads: "David and the six hundred men with him came to the Besor Ravine, where some stayed behind."

Infrastructure, health and educational facilities are lacking. The families in the area consider agricultural activities and hunting as their most important activities. Land status and ownership are complex and the available information is not reliable. The estimates made by MedWetCoast (2003) visualize 60% private land, 27% Beer Saba'a (unregistered land), 12% waqf land (rented land for agriculture) and only 1% government land.

Wadi Gaza has a typical semi arid Mediterranean climate of a hot summer, and a cold winter, as a result from the location in a transitional zone between the temperate Mediterranean climate of the northwest, and the arid desert climate of the Negev and Sinai desert to the east and south (Atrash, 2003). The river within the Wadi has historically flowed from the east to west, dividing the Gaza Strip into north and south, and runs out into the Mediterranean 7 km south of Gaza City (see map: Annex B). The length of the river from origin to mouth is about 105 km, only the last 9 km flows through the Gaza Strip (Awadallah, 2000). There are two main tributaries to the river, Wadi Alshari'a, which collects water from the Hebron Mountains and Wadi Alshallala, which springs from the heights of the Northern Negev (see map: Annex B). Although accurate topographical maps are unavailable, the watershed of river is estimated by Goodson (1999) to cover altogether more than 3500 km². It is considered as the second largest river in the area (Abd Rabou et al. 2007a), following the Jordan River. The maximum height of the river is 30 meters above sea level, but dropping to sea level when reaching the Mediterranean (Atrash, 2003). The width of the Wadi (in Gaza) varies, but is widest near its mouth where it reaches about 100 m and forms an estuary lake and a wetland landscape (Abd Rabou et al. 2007a).

The wetland at the mouth of Wadi Gaza is the only coastal wetland in Palestine and one of the few remaining natural areas in the Gaza Strip that provides a refuge for animals under serve pressure elsewhere in the Gaza Strip (Atrash, 2003). The MedWetCoast (2002b) describes the wetland in 2003 as a rather small wetland compared to other wetlands in the world, covering 25 hectare, yet it was claimed to have a rich exceptional biodiversity and the capacity to store a volume of 100 000 m³ of surface freshwater. The main water source for the wetland was identified as groundwater and floods that accumulates during rainy season in December and January (ibid).

The area of Wadi Gaza contains a large number of endemic plants, reptiles, and mammals represented in diverse ecosystems (MedWetCoast, 2002a). The fauna included in 2004 a total number of 21 reptile species (Abd Rabou 2007a) and 15 mammalian species (Abd Rabou et al. 2007b). The area has also traditionally demonstrated a strategic migration pathway of wetland bird species, boosting 118 avifauna species belonging to 38 different families (Abd Rabou et al. 2007c). According to Atrash (1999) almost 60 % of the birds stops in the area that migrate through the Middle East in Wadi Gaza. The area has for that reason been recognized by Birdlife International as an Important Bird Area (Evans 1994; Atrash 1999). However, it is not only important for its fauna, but also for supporting the existence of many plant species, such as tall emergent reed plants like *Phragmites australis* and *Arundo donax* (Abd Rabou 2007a), in need of coastal and sand dune habitats.

2.2 Moving towards an undesired trajectory

The flora becomes especially important as birds, aquatic mammals, and small fishes are attracted to these areas because they provide food and shelter. This shifting mosaic of aquatic vegetation types are, however, depending on water-level dynamics, since communities of species show adjustment to different water-level environments (USGS, 2004). The returning floods have also traditionally been a controlling factor for the human activities in the area,

resulting in shift in resource use depending on season, including for example increased bird hunting when the wetland becomes flooded and attracts water birds. The period of flooding has in that way been the traditional controlling factor of the wetland with its associated values and services, such as flood control, sediment process, food and habitat supply (see e.g. Adger and Luttrell 2000).

The Wadi Gaza area was used as a recreational site for the people living in area when the Gaza Strip was under Egyptian rule between the years 1948-1967. Back then the area was not densely populated and still covered with lush natural vegetation with pristine sand dunes stretching all the way, including clusters of traditional citrus agriculture (MedWetCoast 2003). Previously, the wetland also provided a profitable site for commercial fishing and the water used to be potable (MedWetCoast 2002b).

Since the early 1970s the hydrological flows have, however, fallen following Israeli water diversion and abstraction of groundwater (MedWetCoast 2003). The excessive pumping for domestic purposes lowered also the groundwater table. The two water sources for the wetland, the volume and duration of surface and ground water flow, therefore decreased considerably, which reduced the amounts of open water in the wetland. Simultaneously, the open pristine area was urbanized with a human population striving to meet its basic needs, which led not only to increased water use but also to rising pollution (ibid). In particular from untreated sewage effluents derived from urban growth within the catchment and from the inhabitants use of the wetland as a solid waste dumping site. The untreated wastewater maintained somewhat the extensive water body, but attracted at the same time a large number of mosquitoes. This turned into a social problem for the inhabitants and efforts to control them were made through the application of pesticides and oils (Atrash 2003). The rapid human population growth in the area also led to increased activity in the site converting habitats to agricultural fields, urbanization and dirty roads with the consequence of overgrazing, poaching, cutting and burning of the natural vegetation (MedWetCoast 2003).

The decreased water quality and quantity along with the destructive land trend led to several effects on both the terrestrial and aquatic ecosystems of the wetland, with an increased pressure on the services provided by the wetland (MedWetCoast 2003). The most important ecosystem services of wetlands, as according to Millennium Ecosystem Assessment (2005), good water quality and fishing, were lost. The water became impure and unsuitable for irrigation and drinking. At the same time important habitats were lost leading to rapid decrease in fishes because of human exploitation and pollution. The traditional water intensive citrus cultivation also decreased significantly due to the reduced water availability.

3. Methods

This chapter both describes and defends the methodology chosen for this thesis. It describes the theoretical basis, considerations before entering the field and that a twofold method was chosen while only one was used as the base for empirical findings. The methods for analysing the data are then disclosed before concluding with a brief identification of limitations and strengths of the methods.

There were three different projects central to the establishment of the Wadi Gaza reserve: “Conservation of Wetland & Coastal Ecosystems in the West Bank & Gaza”, “Wadi Gaza National Park”, and “The Middle Area Sewerage Project”. These three have been used as basis for this thesis. Collection of data from individuals who worked within the Wadi Gaza reserve has been conducted to cover the history of the projects and the reserve.

As presented the thesis pursues three research questions, of which two are in direct need of empirical findings. The first question focuses on the initial phase of the reserve, the second on the result and the last on prospects. This makes the thesis a chronological study. When comparing this approach to Yin's (2003) view of a case study approach many similarities emerge. The case is unique and situated in the past and used to answer descriptive and explorative research questions that demand answering "how" and "what" questions. The focus, and thus the delimitation of the study is on organizational change involving a range of different actors and methods. Neale et al. (2006) consider a case study approach especially suitable when trying to analyze reasons behind a result, by for example capturing what happened in the initial phase or to bring focus on challenges or difficulties in a project. Alternative methods could have been used, such as the historical approach (McAllister 2002), which in many ways overlaps the case study approach. But as Yin (2003) points out, "The distinctive contribution of the historical method is in dealing with the "dead" past, that is; when no relevant persons are alive to report" which restrict the historian method from interviews with participants and on site observations. The case study approach has the ability to offer a richer image of what and why something happened. A diversity that is necessary when trying to understand and identify different stages of this particular reserve.

There is a discussion whether a hypothesis-based (Yin 2003) or evidence based (Eisenhardt 1989) approach should support a case study analysis. During time of theoretical uncertainty, considering the lack of social ecological studies made in areas plagued by political upheaval, well-documented descriptive cases are, however, more likely to inform us than conventional research focusing on testing of hypotheses (Yin 1984). Besides, the research questions are chronologically interlinked with each other and using hypotheses on single events would become too speculative without further evidence.

3.1 Access to the field

The investigation of Wadi Gaza commenced with e-mail correspondence with staff at the Islamic University of Gaza, UNDP and the Palestine Wildlife Society (PWLS) in order to get an overview of the social and ecological situation of Wadi Gaza. Because of the very unstable situation and the impossibility to receive a visa to Gaza it was decided in an early phase that I would be situated in the West Bank and at the PWLS office in Bethlehem. The problem then was that the officials - researchers and NGO members in the West Bank and involved in Wadi Gaza - lack information about the current situation of the reserve since they have been prohibited to enter Gaza since 2002. Material to follow up the later phase of the reserve (the second research question) was for that reason gathered from a distance. The implications of this fact are raised later in this chapter.

Most of the work for this thesis was gained through the assistance of the Palestine Wildlife Society's office in Bethlehem. I travelled to Hebron and Ramallah from Bethlehem to convene officials from the Palestinian Environment Quality Authority (EQA) in informal meetings with the help of PWLS. We discussed the preparation for collecting data, intricacy and how to reach people with relevant knowledge of the current situation in Wadi Gaza. These meetings became very fundamental for my further work since it helped to form the methodological approach and pinpoint important informants.

During these preparation meetings it was decided that I should initiate my work by sending out a multi choice questionnaire including closed ended scaled questions to people concerning knowledge on the evolvement of the Wadi Gaza reserve. This method was used despite the fact that the heart of the thesis is not to measure occurrences. Explanation and description are

rather in focus, mainly depending on qualitative open answers. However, in the preparation meetings it became obvious that I would receive almost no answers if I would initiate the collection of data by submitting a semi-structured questionnaire based on open in-depth questions while (1) concerned informants do not have time to answer open-ended questions due to heavy workload, and (2) since I am from an European country, people in general presume that I would take the information with me home, with no apparent use for them. A questionnaire based on closed ended questions would be much quicker to respond to and, it was reckoned, a good way to gain initial trust and access to the field by establishing contacts with people. I was also given permission to use PWLS logo and name in the questionnaire as to ensure that the information would come to use in Palestine. The questionnaire was later complemented with open-ended in-depth questions to those respondents that were willing and had given especially interesting answers.

3.2 Research design

Although this research followed an evidence based approach, prior knowledge constructions and assumptions are difficult to avoid (Kuhn 1970). Before entering the field a concentrated literature review of the theory was conducted to aid the design of the thesis in general and the research questions in particular. This pre-study and specifically articles by Olsson et al (2004b; 2006) framed the structure of the thesis through dividing the analysis of the rise and fall of Wadi Gaza reserve into two phases; *the preparation phase* and *the transition phase*. Initial meetings with people in the area helped shape the research questions. A qualitative approach has been primarily used to address the research questions. However, and as explained above, access to the field was gained through close-ended questionnaire (Oppenheim 2000). From the qualitative research tradition semi-structured interviews based on an interview guide (Trost 1996) have been the main way of generating empirical data. The results from the interviews was triangulated (Yin, 2003) with an extensive overview of other information, including maps, documents, informal meetings and Internet homepages.

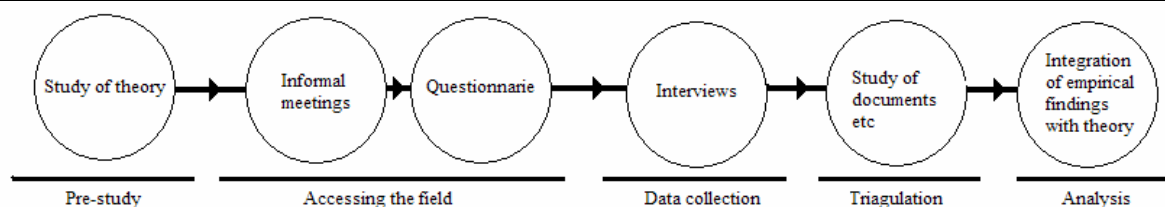


Figure 1. A model of how knowledge was acquired for this case study

3.2.1 The questionnaire

Closed ended questionnaires (Oppenheim 2000) were initially sent out in the beginning of March to people that had been recognized as participating in the initial meetings leading up to the establishment of the Wadi Gaza Reserve in 2000. These were found at the following organizations: EQA, MOPIC, USAID, UNDP, PWLS (2), Green Peace, MedWestCoast, The Islamic University of Gaza and The Palestine University. These particular recipients were chosen as they were pinpointed during the informal meetings to have been central actors in the establishment of the Wadi Gaza reserve. The questionnaire was divided into three sections probing the three research questions; (1) the preparation phase of the reserve; (2) the execution/transition phase; and (3) future prospects of the reserve (see Annex D for questionnaire). The participants were asked to scale what factors they believed to be important for the evolvement of the preparation and transition phases, with a particular focus

on dependability, collaboration, discrepancy and the atmosphere between actors. The questionnaire is closed with a question touching upon possible future visions for the area.

3.2.2 Selection of interview persons

The questionnaire was primarily used to find interested and relevant interview persons. Out of ten sent out questionnaires and seven completed, five interview persons were selected that had all been highly involved in the Wadi Gaza Reserve. The selection was first of all based on the assumption that the experiences of these five represented a comprehensive coverage of the history of Wadi Gaza Reserve, from initiation, planning to collapse. Representatives from the Palestinian government, academia and NGOs represent a fairly wide range of perspectives on the evolvement of Wadi Gaza. Secondly, these persons were willing to put up time for the interview; others rejected to take part in the investigation. All interviewees were offered anonymity in any publication. All interview persons rejected this and asked for that their names were spelled out. The tape recorder was, however, occasionally turned off, on behalf of the interviewee when controversial statements or similar were made. These proclamations were noted but, if used in the text, not quoted or linked to any interview person. The interviewees were: *Said Jalalal*, the former governmental general director of the park; *Bahaaeldin Alfaloji*, the current governmental director of the park; *Abd Rabou*, a researcher from the Islamic University of Gaza; and finally two members at the Palestine Wildlife Society, *Imad Atrash* and *Ibrahim Odeh*.

3.2.3 Interview

The five respondents participated in semi-structured open-ended interviews (Lantz 1993; Trost 1996). In a semi-structured interviews; "the interviewer seeks to catch contextual knowledge about the qualities she has defined herself" (Lantz 1993; my own translation). This becomes realized by "...a broad question is broken down into several question sections [...] The respondent [then] enters deeply into that section considered meaningful by the interviewer". This approach turned out to be especially suitable when trying to capture how the reserve has evolved. Since no one of the respondents holds comprehensive information covering both the rise and fall of the reserve it was necessary to break down the history of Wadi Gaza reserve into sections, corresponding to single phases to which the different respondents had pieces of knowledge. The structure of the interview was based on an interview guide (Trost 1996) including the different phases of Wadi Gaza and the broad question of the thesis; *which factors was critical in the rise and fall of the Wadi Gaza reserve?* The broad question was divided first of all into the two theoretical phases; symbolizing the raise of the reserve, *the preparation phase*; and the fall of the reserve, the *transition phase*. However to comprehensive cover the raise and fall of Wadi Gaza a third phase was necessary to be introduced, linking the two phases together, referred to as the *planning phase*. For each phase simpler questions were formulated (see Annex C for interview guide).

The five respondents were interviewed on several occasions throughout March 2007, using a tape recorder or taking notes. In all interviews overlapping questions were asked, touching upon the broad question; *which factors was critical in the rise and fall of the Wadi Gaza reserve?* But as the interviews proceeded one of the three phases came into focus. The two members at PWLS were interviewed face to face. The goal of these interviews was foremost to capture the interviewees' own role and strategies with relevance for the preparations leading to the establishment of the reserve. The other three respondents were located in Gaza and interviewed per distance using a telephone. Their location in Gaza provided an opportunity to explore the outcome of the reserve since people in the West Bank have been

prohibited to visit the area during the last years. The goal of these interviews was for that reason primary to capture the interviewees' experience regarding the result and outcome of the collective projects in Wadi Gaza. The planning phase in-between the preparation phase and the transition phase was naturally brought by all respondents, since they all were involved in the establishment of the reserve.

3.3 Data Analysis

All the interviews were transcribed. A qualitative evolution method (Bernad 1994) was then used to sort out important factors describing how the reserve developed. The analysis did not focus on similarities or differences in the arguments of the respondents; rather the purpose was to develop a case description, addressing social mechanisms and explanations behind the development and collapse of Wadi Gaza Reserve. The analysis was done within the given theoretical framework of resilience, adaptability and transformability, with special attention on the imperative social components as discussed before (see Introduction). Using the rich data from the interviews, a gradual interpretation of how and why the reserve of Wadi Gaza had risen and fallen, could be built through the theoretical framework. Using theoretical categories, particular events came into focus; identification of problems, social coordination, associated institutional arrangements, trust and leadership.

3.3.1 Structure

The empirical presentation is structured around three different phases; the preparation phase; the planning phase; and last the transition phase. The additional planning phase has a very short time frame compared to the other two phases, since it only elucidates how the three central organizational projects (see page 13) were structured. The role of the planning phase is merely to bridge the other two phases in a comprehensive empirical direction. So when the empirical findings move into analyzing the rise and fall of the reserve, only the theoretical phases are present. There is furthermore a theoretical difference between how these two phases are approached in the analysis. The more successful preparation phase is explained by components important for transformability and adaptability, while the less successful transition phase is explained through the inverse, i.e. the lack of such components. Based on the analysis of the empirical findings a fourth phase, the prospect phase, is subsequently included based on future prospects and alternative solutions for Wadi Gaza guided by components enhancing adaptability. This section deepens the discussion on the failing transformability by additional theory inputs. The thesis then finally strives towards analytic generalization (Yin 1984) so as to identity factors controlling transformability.

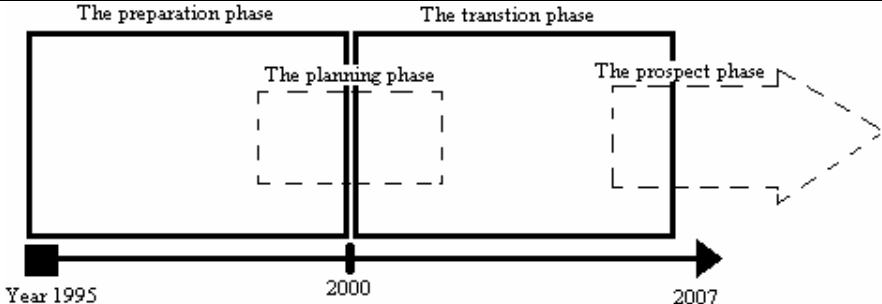


Figure 2. A conceptual model visualizing the chronology structure and the four different phases of the thesis. In the empirical findings the two theoretical phases, the preparation and transition phase, are presented together with the intertwining planning phase. When analyzing the rise and fall of the reserve is, however, only the two theoretical phases extant, given birth to the prospect phase in the later part of the analysis.

3.4 Trustworthiness and Authenticity

Given the approach of empirical collection, selection of interviewees and data analysis questions concerning generalization, validity and reliability should be addressed. As already mentioned no on-site observation could be conducted, due to Israeli blockage and the political unstable situation. Instead the study is based on second hand information. Some relevant documents were at the time also difficult to get access to, due to the poor setting of the government in Gaza and the linguistic barrier. The general patterns of Wadi Gaza described in the thesis are presumably accurate, since all sources studied for this thesis pointed towards a coherent direction. The reliability of the minor assertions may, however, be vague; since there always is a risk that the respondents are trying to emphasize specific factors, especially since people experience things differently. The notion of one objective reality is, however, rejected in this thesis whereby in the words of Kvale (1996) “specific, local, personal, and community forms of truth, with a focus on daily life and local narrative” is accepted. In other words, my own interpretation of the rise and fall of Wadi Gaza strives to put an equal emphasize to all circumstances, through a given theoretical framework, instead of formulating one linear historical objective truth.

Two potential informants were reluctantly excluded from taking part in this investigation. The international society, including UNDP and USAID, rejected as they did not respond to emails or calls, and local people living by Wadi Gaza could never be approached since there were no access to the area. One attempt to interview the locals through a connection in the Gaza Strip failed. Involving the international agencies and locals could have deepened the understanding for their actions and behaviour. Some statements remained therefore unchallenged and may have received advantageous attention in the analysis. The interference of the five different respondents, covering three different societal sectors, assumed however to have the capacity to represent a fairly broad perspective, including the perspective of the excluded actors. As it was assumed that the involved respondents should possess additional knowledge concerning the acting of excluded actors

4. Empirical findings

In the following chapter the main empirical findings in three subchapters presented are mirroring the rise and fall of Wadi Gaza reserve. The first subchapter presents the rise of the Wadi Gaza reserve, and corresponds to the preparation phase, followed by the second subchapter, intertwining the rise and fall of the reserve, in a planning phase. The last section illustrates the fall of the reserve, and corresponds to the transition phase.

4.1 The Preparation phase: Preparing the system for change (1995-2000)

Analytically the preparation phase starts in 1995. Then Imad Atrash, a doctor in ornithology, visited together with a colleague from Holland the wetland landscape in central Gaza, recognized as an Important Bird Area (Evans 1994), to investigate and observe the migrating birds. The friends did however not only find an astonishing bird population, but also a much degraded wetland under huge human pressure. Or as Atrash puts it “When we went down to Wadi Gaza in 1995 to watch birds, something else caught our attention. The Wetland and its wildlife were in a devastated condition”. The wetland was almost completely covered with algae as a consequence of the recent urban growth within the catchments, which also used the area as a solid waste dumping site. Birds lay dead on the ground due to the uncontrolled use of pesticides and oils to fight mosquitoes.

During this period the Palestinian National Authority (PNA) was established as a result of the ratification of the Oslo accords (DOP 1993). This encouraged Atrash to call attention to these wetlands by considering the area as an excellent place to establish the first national park under Palestinian rule for the Palestinian people³: “[In this light] I started to contact key individuals, with a potential interest in the area, to find support for nature restoration and a national park”.

The first step was to get the Palestinian government on the same ship. The head of the environment section at that time in the Ministry of Planning and International Cooperation (MOPIC) picked up the idea immediately and put the conservation feature on their agenda. However, since the Palestinian government was just recently established, almost no funds were available. The project was therefore in desperate need of external support.

For this reason Atrash’s Dutch colleague went home to Holland with a mission to convince the Dutch aid agency to support the plans. At the same time Atrash established contacts with one of his old students, who at that present time was employed at the UNDP/PAPP as a project leader; “UNDP got interested in the reserve which turned out to be a great push for the further work, since they had the capacity to mobilize a broad network of donors and other international organizations”

4.1.1 Funding and social networks

Parallel with the joint forces of Atrash, UNDP and MOPIC a window of opportunity was slowly opened as the area gained both international recognition as well as national. The importance of the area was stated in the Regional Plan for the Gaza Governorates (MOPIC, 1998) and the Dutch aid agency granted money to support initial management work in Wadi Gaza. At the same time the MedWetCoast-project was launched; a UNDP- project aiming at conserving the biodiversity in coastal and wetland ecosystems located in the Mediterranean basin, complying with the recent principles of biodiversity protection, ratified in Jakarta 1995 (MedWetCoast, 2005).

A series of crucial meetings and workshops, often prepared by Atrash and officials at PNA and UNDP, were held between 1997-2000, addressing the environmental degradation of Wadi Gaza and later the possibilities of large-scale conservation and management. Atrash was chosen to be the Wadi Gaza Project Activities Coordinator; “Sometimes attend altogether 50 to 60 stakeholders with different interests, representing a broad scope of the society”, including for example (PWLS 2003):

- The local tribe leaders, known locally as “Mukhtars”, with a considerable influence on the local population, were attracted by the job opportunities in the reserve;
- A researcher at the Islamic University of Gaza, who was interested in the unique ecological values of the area;
- The director of Green Peace Association in Gaza, interested in the focus on awareness and education;
- The director at the Birdlife International, intrigued by the project’s positive aspects for the endangered birdlife; and
- The director general of Ministry of Tourism and Antiquities, engaged by the unique values of the area and its potential to attract eco-tourists.

³ Other reserves that earlier had been established were under Israeli control. These reserves have been accused to be established for military and political purposes alone, hindering local people to visit and utilize the area (UNEP 2004).

The different actors came to represent different dimensions of the over-arching goal for the Wadi Gaza project; environmental restoration, conservation, socio-economic development, education, recreational and eco-tourism. The main outcome of the meetings was an understanding of the interrelated connection between poverty and environmental degradation and that the establishment of a national park could be an opportunity to boost economical development in the area. “A feeling of a common goal and prospects” evolved according to Atrash during these meetings and that; “the ecosystem degradation was reversible so it was decided that it was possible to restore the wetland, which really got things going”.

Holland eventually pulled out from the project however, since they decided to support agricultural projects instead of environmental. But instead the Swiss came onboard and took over the Dutch role and granted 130 000 dollar (PAMS 2007a) to support the first phase of the Wadi Gaza project. The project succeeded also by the involvement of UNDP/PAPP to attract USAID, who granted 3.4 millions dollar (PAMS 2007b) for the very establishment of the Wadi Gaza reserve. By its geographical location at the Mediterranean the project also succeeded to receive general assistant and expertise from the MedWetCoast project.

4.2 The Planning Phase: A planning Process (1999-2001)

The final plan was presented under one umbrella: to restore the social and ecological values of the Wadi Gaza area. The plan was supported through three projects; “Conservation of Wetland & Coastal Ecosystems in the West Bank & Gaza” founded by The Swiss Agency for Development and Cooperation (SDC); “Wadi Gaza National Park” funded by USAID; and “The Middle Area Sewerage Project” jointly founded by three donors. The first project focused foremost on preparing the establishment through an awareness project, whereby the following projects had the responsibility to establish the reserve and necessary physical infrastructure. The funding for the two projects where decided to be channelled through UNDP including the responsibility to provide technical support and execute the projects (UNDP 2000). The specific implementation of the projects was, however, directed to different actors in Palestine.

4.2.1 The Middle Area Sewerage Project

Parallel to the conservation and the awareness project, there was also a common project, brought together by UNDP. The project was in principal not a component of the conservation project but rather a practical prerequisite to restore values of the wetland. It focused on finding a solution on the main root of the problem, the uncontrolled flow of sewage to Wadi Gaza (UNDP 2000). The project was initiated in 1999 and was planned to be finalized in 2007.

These projects address the infrastructure needs in the sewerage sector in Gaza City and around the Wadi. The implementation of these projects would alleviate constraints on the Wetlands Project.

UNDP 2000

The solution to the sewage problem was based on collective efforts from three different intertwined projects; “The Middle Area Sewerage Project” founded by the Danish Aid Agency (DANIDA), “Wadi Gaza National Park” supported by USAID and finally the “Sewerage Project Gaza Central” granted by The German Federal Ministry for Economic Cooperation and Development (BMZ). In early 1999 the Danish Government expressed its commitment to upgrade infrastructure in the Middle area of Gaza Strip, aiming to improve the environmental situation and the further health risks by constructing a sewage collection

network in to Wadi Gaza and collecting wastewater from the whole of the Middle Area (UNDP 2000). The collected wastewater was planned to be treated by a sewage treatment plan forming part of the USAID conservation project (MedWetCoast 2003). The German government had committed financial resources to later replace the temporary treatment plant with a permanent central treatment plan to be operational from 2007 serving both Gaza City and the middle Gaza (PAMS 2007c). All efforts aligned with the achievement of the Millennium Development Goals.

4.2.2 Conservation of Wetland & Coastal Ecosystems in the West Bank & Gaza

The project funded by SDC had a close connection to Imad Atrash conviction, which he had promoted from the beginning, on conservation through education;

This project assists in the implementation of an environmental and public awareness program that aims at the conservation and protection of biodiversity in Wadi Gaza.

PAMS 2007a

Imad Atrash funded and developed in 1999 the Palestine Wildlife Society (PWLS), of which he became the director. The Wadi Gaza Project, funded by SDC, became their first project. PWLS was responsible to plan and implement the project with the assistant of Green Peace Association and Palestinian Agricultural Relief Committees (PARC). The project covered the period of October 2002 till February 2003, focusing on awareness campaigns to establish a common ground between conservation needs and local community needs, as to change the behaviour of the local communities (PWLS 2003). The objectives of the project were to build capacity of Palestinian NGOs (e.g. Green Peace), local leaders and school teachers to generate leaders ready to educate the public in environmental awareness, including study tours to similar reserves in Jordan and Egypt. The educated leaders would then implement the education activities in Wadi Gaza such as voluntary cleaning campaigns, weekly guided tours and information activities intended for the local communities and the school children in Gaza.

4.2.3 Wadi Gaza National Park

The main project funded by USAID consisted of a broad agenda for the area interweaving the ecological conditions with the socio-economical factors;

“The project aims to respond to the increasing unemployment problem in the Gaza Strip in general and Wadi Gaza area in specific while promoting agricultural development and the conversion of the wetlands of the Wadi Gaza and its vicinity from the dumpsite into a model large-scale National Park.”

PAMS 2007b

The project was launched in the beginning of 2001 to facilitate the establishment of the Wadi Gaza National Park. The project aspired to enhance the physical structure of Wadi Gaza in order to facilitate the conservation of its biodiversity and environment, while at the same time generating emergency employment opportunities by implementing activities such as (MedWetCoast 2003); cleaning campaigns; building crossing bridges or culverts; establish hiking trails for visitors, observation towers, water harvesting ponds and a information center. The Environmental Quality Authority (EQA) was decided to be the implementing agency of the project for the Palestinian Authority.

4.2.4 The Management Plan

In parallel to the implementation activities scientific projects were planned and prepared by the MedWetCoast including international experts from the Station Biologique de la Tour du

Valet, France (MedWestCoast 2003). Their first active stage at Wadi Gaza was collection of data, past and present, on the status and values of the site. The outcome was four different surveys and investigations⁴, which were analysed and presented in the final Management Plan for Wadi Gaza (MedWetCoast 2003).

The management plan was thought to secure the continued existence of the park and the Wadi Gaza conservation projects after the international departure. In the plan Wadi Gaza was proclaimed a national park and thus under the protection of Palestinian law. For this reason the Palestinian National Authority (PNA) had in general, and EQA in specific, the legitimate responsibility of the park. All further projects relating to Wadi Gaza were decided to be handled by PNA institutions after the international projects were finished. The Ministry of Planning and International Cooperation (MOPIC) was for example appointed to negotiate with land owners to change land use towards nature conservation by offering governmental land as compensation (MedWetCoast 2003).

The action and activities of the management plan, as to finalize the establishment of a national park, was organised into a series of six themes which corresponded to six principal objectives (MedWetCoast 2003):

Maintenance and conservation	Rehabilitation and restoration	Sustainable resource use	Socio-economic development	Public awareness⁵	Administrative
Create an in-build fine-tune feed back system , based on a response obligation for each single project and a comprehensive review during every last two month of the year Protection of the wetland from hunting, urbanization and agriculture	Restore the flora and fauna diversity Stop the dumping of waste and use of pesticides. Reduce the eutropication, by building a temporary treatment plant	Eliminate overgrazing, uncontrolled woodcutting and the withdrawal of sand and stone from the wetland Prevent further lowering of ground water	Promote income generating activities compatible with the conservation objectives Facilitate the improvement of the environmental municipal services	Promote eco-tourism and facilitate scientific research studies Continuing promotion of public awareness of the site among youth	Recruit a local team to help implementing the management plan Provide a management advisory structure which includes local stakeholder

4.3 The Transition Phase: Transforming a wasteland into a wetland (2000-2007)

In recognition of Wadi Gaza's importance as a natural area and the only wetland in Palestine, Wadi Gaza was declared a nature reserve in June 2000 (MedWetCoast 2003). Initially activities were implemented according to plans. For instance, Palestinian institutions started to monitor the area and local people were employed to clean up and keep an eye on the site. Hiking trails around the Wadi and observation towers for educational and recreational purposes were built to attract visitors. Also school trips, meetings with farmers, and work shops were arranged to increase awareness of the site together with the distribution of audiovisual teaching aids. An information center, where stakeholders, visitors and researchers could meet, was built along with a forum for local representation named the Local Management Advisory Committee in order to enhance democratic participation. A crossing bridge was constructed to reduce direct human motion in the area together with an introduction of a more sustainable agriculture, including for example water retaining dams to filter water before reaching ground water, and planting of indigenous trees in the surroundings. Numerous investigations were simultaneously conducted in the site to enhance

⁴ Study on; Flora and fauna (MedWetCoast, 2002a); Hydrology (MedWetCoast, 2002b), Socio-economic (MedWetCoast 2002c) and Land-use (MedWetCoast 2002d).

⁵ This was the second phase of the awareness campaign and should have begun where the SDC project ended.

the scientific knowledge. An inventory of bird populations in Wadi Gaza during 2002-2004 (Abd Rabou et al 2007c), by doctor Abd Rabou at the Islamic University of Gaza also indicated a significant increase of migrating bird species the following years after the establishment of the reserve. However, conflicts and complications also developed early, especially between local habitants' utilization and the conservational efforts.

4.3.1 Knowledge building and local mistrust

Farmers threatened already from the beginning to stop the project if it should target their land ownership and livelihood. Ibrahim Odeh, employed at the PWLS shares his experience from the initial meetings with the farmers: "when we at first approached them, we thought almost they would kill us. Farmers were afraid that the government would take all the lands from them, and if you take their land you take their souls. So it was really not an economical issue alone." Therefore several meetings were initially arranged with representatives from the local community and the Council of Agriculture Union (PWLS 2003) aiming at establishing a bridge between conservation needs and local needs. The meetings resulted in an opening and the farmers started to realize the extensive needs of protecting the area to secure further productiveness, or as Atrash puts it; "We cooperated successfully with three of the Mukhtars from the local community and one of the chiefs established the Wadi Gaza Community for protection of culture and nature activities".

Integrating the awareness project into the conservation project turned out to be a bigger challenge than expected, especially since the state (PNA) received the overriding responsibility over the park. This excluded other actors involved in the emergent social network from the management board. The result was that the actor building trust had nothing to say in the decision making body. This seems a crucial blow to the organizational efforts of creating adaptability. Atrash explains; "The people respected from the beginning the protection of Wadi Gaza. I think we convinced the majority of the land owners [...] but the communication between EQA and the locals were not dealt in two levels, as it should." Lacking communication initially between the implementing agency of the reserve, EQA, and the local inhabitants of the Wadi Gaza area, breed mistrust. And when the government realised the consequences of an excluded public it was too late, or as Said Jalala, former official at EQA, puts it; "We tried to make them [the local community] partners of the project [...] but whatever we did, they did not trust us". Because of mistrust only one year after the reserve was launched conflicts with the community led to boundary changes which reduced the delineated area to the Wadi bed alone⁶ (MedWetCoast 2003) producing a clear demarcation of the protected area. This is a crucial event as it hampers further development towards ecosystem management.

4.3.2 The al-Alqsa Intifada

In September 2000 the Palestinians started the al-Alqsa intifada. In response the Israeli Defence Force closed the Gaza Strip borders and introduced general travel restrictions for the Palestinian people. For this reason PWLS, located in the West Bank, was prohibited to visit Gaza and to continue with the educational activities and general work on highlighting the links between conservation and local needs. The exclusion of PWLS led to a reallocation of all the further educational activities to the assistant organizations, PARC and Greenpeace in Gaza. All the activities were nonetheless implemented according to the plans, or as Atrash

⁶ The original site boundaries established in 2000 comprised the course of the Wadi plus adjacent areas affecting the Wadi and affected by changes to the Wadi (the yellow area of the map in Annex A). After the boundary changes the area was reduced to the Wadi bed alone (the green area of the map in Annex A).

puts it; “I think in the end that all activities in Gaza were more or less implemented, thanks to the work of our partners in Gaza. Our role [PWLS] became instead to prepare and design the project and to follow all the steps of the implementation in Gaza and to report back to UNDP. [...] But you know, Wadi Gaza was almost like my baby, I am sure that if we had continuous admittance to the area, everything would have been different [...] what can I accomplish from here?”

The situation for the local people was very exigent during this period of time; 50 % of the local communities’ income was completely dependent on labour in Israel before the intifada (MedWetCoast 2003). After the uprising all these families had to look for alternative sources of income, which were mainly sought in agriculture, but the majority lost their jobs and the unemployment rate rose in the area to 80 % after the al-Alqsa uprising (UNDP, 2002). The job opportunities provided by USAID in the park met for this reason a very high demand, and as Abd Rabou notes; “Even if it was a strong commitment among the locals to conserve the land [...] people not employed in the USAID project, started to question why the neighbour had been employed but not themselves. The unemployed locals told me, during my field work in Wadi Gaza, that there is nothing for me in the conservation, since I have not been employed by the government”. At the same time the employment generation project was only operational during a limited time period, Abd Rabou continues; “the majority of the employed people lost their work and income only after six to 12 months [...] the locals involved became very disappointed and lost all the remaining trust in the project”. The employment generation project did clearly not meet the economical boost people expected, which were especially importance due to the Israeli dismissal and the armed conflict.

Local people in general reacted therefore negatively to almost all the conservation projects, since most of the activities did not address any of their own basic needs. This mistrust turned ultimately into people destroying physical infrastructure. Abd Rabou brings on an example; “People who have made ecological research in this areas have used the observation towers a lot. But bird watching is hard to define and an unknown task in the public eye. Most of the people living in the area don’t understand the importance of the observation towers, so the towers have been gradually destroyed, and today all the towers have been lost with no care from EQA or other agencies”. Said Jalala continues: “We took over the project when UNDP left the area, but after a few months everything was destroyed [...] The information center has for example been occupied by other people, there is no one at the office any longer, and the infrastructure that remained, the bridge crossing over Wadi Gaza and the water retaining dams, was destroyed by Israeli military last winter.”

4.3.3 Lack of governmental enforcement

The Palestinian government failed simultaneously in the continuing work, after the international departure, to maintain the infrastructure and implement the management plan. According to Bahaaeldin Alfalaji, currently responsible within the government for the area, there was no remaining funding after the international departure to uphold the plans; “when the USAID project finished, there were no salaries to pay the guards or to run the activities of the information centre, which was supposed to be the head quarter in implementing the management plan after the USAID completion.” At the same time the project lost its importance, as Said Jalala puts it; “Wadi Gaza was once discussed in one of the cabinet meetings with the chairman, but after the political situation conservation is not on the top of the political agenda any more [...] These questions are not the very priority right now, compared to the lack of health and security, unfortunately. Today for example 9 people were killed in Gaza due to the lack of functional treatment plants”

The newly established Palestinian government also faced some teething troubles, including lack of coherent enforcements, which made it difficult to direct the efforts on a unanimous path, or as Said Jalala puts it; “The management plan has not been implemented since there has been lacking governmental control and enforcements. There was also no coordination between the different governmental bodies involved in the management. So when the communication between the ministries was lost the implementation became very difficult to carry out.” One example of this is when MOPIC were in negotiation with land owners to offer governmental land as compensation in order to protect critical habitats of the remaining land, being private regime to the largest percentage. The efforts to make a recreational area and the construction of facilities in the site to generate local income, made, the surrounding aware of the general value of the site. This increased the land value dramatically, according to Said Jalala; “the price on a square meter was 7-10 dollar/m² [before the area received attention]. Now the value of the land is about 70-100 dollar/m².” A company bought for this reason the properties from the local owners, who sought according to Bahaaeldin Alfaloji “to fill up the wetland and later divide it, to sell it for a higher price. We tried of course to stop this and the company agreed to be compensated with governmental land. This was, however, the responsibility of the MOPIC. But when we approached the company they told us that they have been waiting for a long time and no one had offered any lands to them.” Every side was blaming the other, Bahaaeldin Alfaloji continues ”The governmental body told us that the company had refused any suggestions. So the land owners just continued with their plans to fill the wetland and turned it to terrestrial land.”

4.3.4 Freezing international efforts

In the year 1999, the estimated local discharge of wastewater quantity that reached Wadi Gaza, was about 5000 m³/day (DANIDA 2000). In early 1999 when the Danish Aid Agency (DANIDA) constructed a sewage collection network to assemble wastewater in to the wetland of Wadi Gaza from the whole of the Middle Area the situation drastically changed. The treatment plants, planned to treat the increased amount of sewage, were never built, since the US government and the German government decided to freeze all investment directed to Palestine in response to the uprising. Or as Bahaaeldin Alfaloji, puts it; “When al-Alqsa Intifada came out in September 2000, the USAID backed out from the sewerage project and the Germans delayed the construction of the new central treatment plant. The consequence was a wetland supplied with 15000 m³/day, an amount of pollution the small wetland was incapable to naturally break down.” So the international collective efforts to find a solution to the uncontrolled flow of sewage to Wadi Gaza, halted with a network pumping huge amount of sewage from the whole Middle Gaza into the already eutrophicated wetland. This led to a clear deterioration of the wetland according to Bahaaeldin Alfaloji; “why there was no point to tell people to take care of the reserve. Since when they [locals] saw that the reserve was never really becoming clean in the first place, they were not interested in taking care of the area, so they continued to dump solid waste and cut trees in the area.”

5. Analysis

This chapter integrates theoretical considerations into the empirical findings and is divided into the two phases of transformability; the preparation respectively the transition phase. In the last part of the analysis a prospect phase is introduced, summarizing the outcome and presenting a desired trajectory of the transformability and moves thereafter to exploring the problems of integrating such as approach to an area under heavily social stress.

The transformation of Wadi Gaza into a protected reserve has failed. Wadi Gaza is today in a devastated state. There is no longer a protected area or a reserve, it has thus collapsed. Almost

no water currently reaches the area, except from untreated sewage, since the annual flooding and the groundwater levels have fallen due to increased upstream and domestic water exploitation. The local use of the site as a solid dumping site along with the application of oils and other pesticides has increased. The land owning company has almost completely drained the only surface water resource in Gaza. So the situation of the wetland was in fact better before the area faced all attention and projects, or as Abd Rabou puts it; “Today more than 80 % of the wetland area has been drained for construction purpose and you can count all the birds on one hand. Rather than the hundreds or thousands that could be spotted only 3 years ago [...] 4 million dollar has been spent and today nothing is achieved. All this has only contributed with even more problems.”

5.1 The preparation phase

In the analysis of the different phases of Wadi Gaza the focus has remained on pinpointing strategies and social processes that could explain the promotion and collapse of Wadi Gaza reserve. Before identifying the social mechanism that trapped the implementation and prevented a further societal transformation of the social-ecological system, it is necessary, first of all to recognize the preparation phase, and what factors realized the establishment of the reserve, since it gives the prerequisites and frame the later collapse.

Table 1. *The dominant social factors essential for the preparation phase*

- A social ecological system in need of a new configuration
- A key individual with a vision
- The emergence of a social network and a strategy
- A window of opportunity and financial support

5.1.1 The key individual

Gunderson (1999) and Folke with colleagues (2005) argue that ecological crises or rapid changes may provide opportunities to trigger innovation and organizational change. This is particularly true if there is a key individual (Olsson et al. 2004b) or a social network (Gunderson 1999) in the area ready to highlight the extensive need for taking measures towards a more successful organizational structure. It is clear that in the case of Wadi Gaza the poor ecological conditions of the park triggered the initial interest and later the establishment of the reserve.

The area, recognized as an Important Bird Area (IBA), was degraded due to human exploitation. One of the ornithologists in particular, Imad Atrash, brought the problem to the national (MOPIC) and the international level (UNDP), where recognition was found for the establishment of a national park. In this way a particular individual spanned and communicated the problem to a wider audience (see figure 2). This was partly possible since Atrash, as a former university doctor, had many old students at present working within influential organizations. The communication was based on a basic overriding vision to the problem, which happened to frame the later activities; the idea of establishing a protected reserve in the area. These individual efforts provided leadership functions and triggered the organizational change in Wadi Gaza, which may be referred to Burns (1978) original idea on transformational leadership, further developed by Westley and Mintzberg (1989); (1) where a leader establish a vision of a desired future state, transcends short-term goals to focus on higher intrinsic needs, and simultaneously (2) trying to communicate and align people to view the situation differently than they otherwise would, which may (3) generate the followers to take action and enact the vision.

5.1.2 The emergence of a social network

The dialogue between the initial actors, Imad Atrash, the head of the environmental section at MOPIC and the project leader at UNDP, spread in line with the ripple effect. It started with one single actor and became a multi-actor process as people at different organizational levels acknowledged both the problem and the attached vision. Soon a network was mobilized, consisting of actors from different societal levels and interests, from locals, academia, NGOs and officials (see figure 2). All attracted by different opportunities that the establishment of a park could generate (p. 12). A structure that may be connected to Westley’s (1995) term of a “bridging organization” where information flows horizontally and vertically, face to face, between disciplines at several levels. These intertwined organizations are essential for the organizational transformation into a desired trajectory since they provide, in the words of Folke et al. (2005) “opportunities by bringing in resources, knowledge, and other incentives for ecosystem management.” The bridging process in the emerging social network in Wadi Gaza generated a knowledge pool including nodes of expertise (see e.g. Olsson et al. 2004b) interacting below one common roof. The interactions of different background bred innovation; UNDP and the local community had for example a traditional focus on social issues, which provided a combined emphasis on both the social and the ecological system. The outcome was an understanding of the interrelatedness between poverty and environmental degradation, which resulted in an intertwined strategy promoting social and ecological solutions hand in hand. In this way the network continued on the processes Imad Atrash had initiated and the vision developed into a strategy through a social learning process (Lee 1993), i.e. “learning that occurs when people engage with one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action” (Schusler et al. 2003).

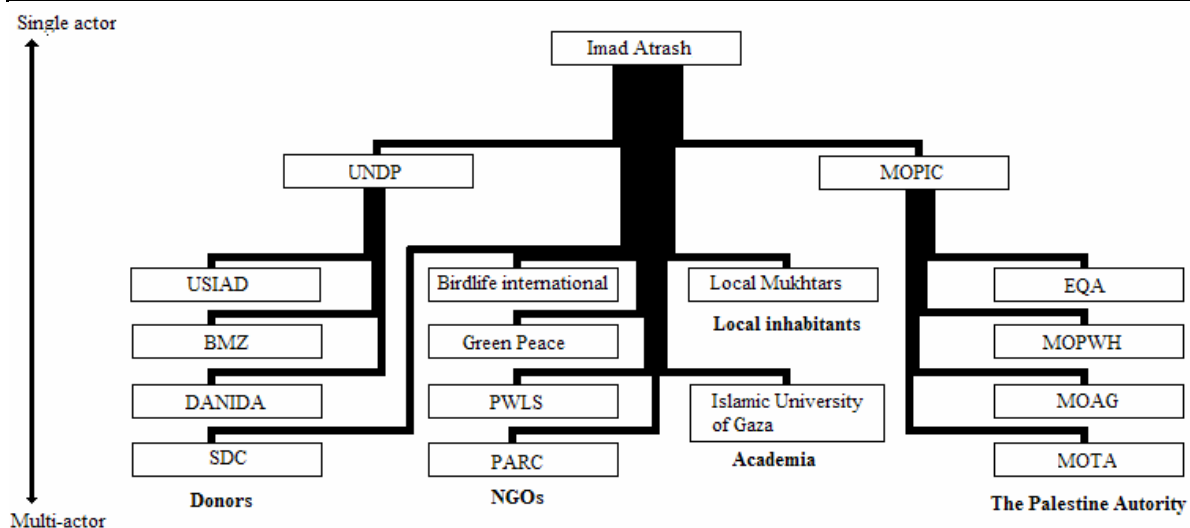


Figure 2. A connection scheme describing how the work of one actor became a poly-actor process and triggered a social network to emerge.

5.1.3 A window of opportunity

Conservation and environment were not on the top of the international aid agenda during this period of time (Ström 2007), demonstrated by for example the Dutch withdrawal from the project. The integrated strategy, incorporating human concerns in to the conservation agenda, made, however, the project appropriate for the time. By providing alternative solutions, including the human sphere into the conservation aspects, can help decision-makers to

perceive problems differently and seek for new policy. This is by Kingdon (1995) referred to as a problem-driven window. The reframing of the isolated focus on ecological concerns into a strategy intertwining social issues with conservation made thereby the search for resources and financial support possible; Imad Atrash, with his educational and ecological experience as a teacher at the university, attracted 130 000 dollar from SDC for *educational purposes*; to boost awareness and build up communication and common goals with the local inhabitants. UNDP/PAPP, with their traditional focus on poverty reduction, succeeded to attach USAID to grant 3.4 millions dollar for *employment generation* and physical infrastructure for the park. To create a holistic solution to *the health problems* and the discharge of untreated sewage into the wetland UNDP complied and combined also ongoing international projects/plans in the reserve. The conservation feature was in this way integrated into the classic aid agenda.

The political climate may also be argued to be ideal for highlighting the need of a reserve in this area during this particular time for three reasons:

- The international development aid was at that time foremost project driven (Alesina and Dollar 2000);
- A sub organization to UNDP, the MedWetCoast, was formed during this time (in 1999), with the specific focus on conservation of coastal wetlands in the Mediterranean basin, which provided crucial incentives for an international focus on this particular region; and
- The very establishment of the Palestinian National Authority provided initially also a unique appealing opportunity of launching the first national park for the Palestinian people. The involvement of the new government also gave legitimacy for the efforts of establishing a reserve, since UNDP found a partner to work with on the same organizational level to direct funds and the responsibility henceforth.

This specific situation and the integrated approach made it possible to attract financial support. All components mentioned by Kingdon (1995) essential for a window of opportunity were available; the timing was perfect, a problem was recognized with an obtainable solution, suitable for the time. A key individual and a social network also played a key role (see figure 2). The first phase of the transformation in Wadi Gaza was thus successful. Through effective lobbying and using a window of opportunity the Palestinian National Authority launched the national park simultaneously with the three projects.

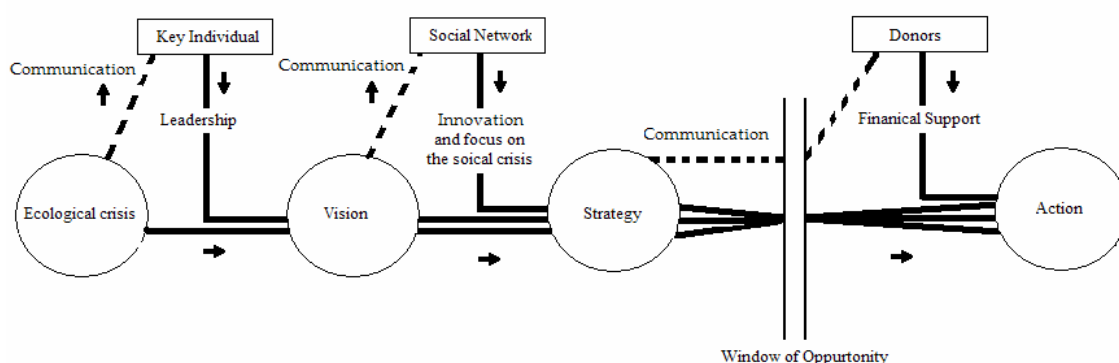


Figure 3. The social process that led towards the establishment of the reserve. The ecological crisis in Wadi Gaza was recognized by one key individual, who promoted leadership functions and communicated a vision and the problem to a social network. The social network brought innovation, intertwining the ecological crises with the social crises, which resulted in a strategy. Through a window of opportunity the social network and the key individual succeeded then to stimulate donors to support the strategy

5.2 The transition phase

The reasons for the failing transformability capacity are several and all intertwined in each other. It is, however, important to distinguish between root causes and triggers. While root causes refer to the underlying factors in a conflict, triggers constitute factors that cause a conflict to escalate⁷. This distinction is important when trying to understand the dynamics of a social ecological system and to coordinate effective efforts. So even if the interrelatedness is close there is a difference between factors that merely triggered the system to collapse and factors that prevented the transformation of the social-ecological system into a new resilient configuration.

Table 2. *The main social factors that prevented a further transformation of the social ecological system*

- Dependency on external support
- Top-down management
- Polarization and mistrust
- Lack of leadership
- Fragmentized efforts

Even though it could be argued that the conflict with Israel and the poor socio-economical conditions caused the system collapse, the rise of al-Alqsa Intifada can also, and only implicitly from a resilience perspective, be regarded as an external disturbance rather than a social mechanism that prevented the transformation of the organizational structure. Through a resilience perspective, the Palestinian uprising and the later conflict merely triggered the system to collapse and thereby elucidated weaknesses in the social system and thus the organizational structure. It could be argued that if the organizational structure in Wadi Gaza was resilient and well prepared it should have been able to withstand external shocks, or in the words of Adger (2000); “social resilience is defined as the ability of human communities to withstand external shocks to their social infrastructure [...] in form of environmental variability or social, economic, and political upheaval”.

5.2.1 Dependence on external support

External actors and resources did play an essential role in the preparation phase of Wadi Gaza, through interacting with other actors, in creating civic forums as well as social and political spaces for deliberation. Furthermore, there is no doubt that external actors made the establishment of the park possible, by acting both as donors and as executors. This simultaneously made the system heavily reliant on external commitments, which have been identified (e.g. by Ostrom 1999) as an obstacle towards ecosystem management. The case of Wadi Gaza is a clear example of this, especially since the economical and participating support was evidently inadequate;

- The employment generation project ran out of money and locals lost employment, (whether it was connected to governmental corruption or deficient funds remains unsaid). The project was, nevertheless, in need of continued investments, which were frozen in response to the Palestinian uprising;
- The international search for a solution to the main environmental problem in the site, the uncontrolled discharge of sewage, became an environmental catastrophe; not only did the project fail but it was interrupted half-finished with an infrastructure pumping

⁷ See; <http://www.sais-jhu.edu/cmtoolkit/aboutus/index.html> last checked 2007-05-24

15000 m³ sewage per day, into the already eutrophicated estuary lake, compared to the former 5000 m³/day.

In this way neither the social nor the ecological problem of Wadi Gaza was solved, as the employment generation and the sewerage project ended abortively. When no solution was found to address the social and ecological problems, other actors lost engagement in the continuing efforts. Simultaneously the local management had few possibilities to do something about it, since it was in the hands of external factors/actors beyond the span of the management board and thus uncontrollable.

5.2.2 Top-down management

When the project was about to be launched the social network was dissolved into three different projects. The responsibilities for implementing the projects were directed to specific single actors, which former played a central role in the network; PWLS, UNDP and PNA. The Palestine National Authority received the overruling responsibility of the park; all other actors were excluded from the management. Due to the natural complexity in social ecological system it is, however, difficult for one single actor to possess all knowledge needed for successful ecosystem management (Holling and Meffe 1996; Berkes 2002; Brown 2003; Gadgil et al. 2003). It is obvious that in the case of Wadi Gaza the centralized governance was inflexible and did not manage to alone head by oneself. Janssen with colleagues (2006) connect centralized failure to the low response capabilities built in centralized management; as all nodes in centralized bodies are much depended on a common central from where all nodes receive analogous information, the response capabilities become narrow, which stall innovation and alternative responses to forthcoming problems. So when surprises and conflicts hit the system, centralized management tends to follow the customary often unsuccessful response paths (Tompkins and Adger 2004). The centralized government in Wadi Gaza did, however, not only show a narrow response capability but an extensive lack of responses towards problems and surprises. A consequence of this was that ownership of the site was never under governmental jurisdiction, and therefore there was no legal protection of the area or possibility of enforcement. The empirical findings explain this by the poor internal settings within the government, which stalled a broad governmental management body to evolve, including different departments with specific responsibilities. The lack of information flow within the government formed thereby a management body with an extensive inability to enforce necessary legal and authority actions. This made the implementation of the management plan and activities promoting a new trajectory problematic.

5.2.3 Polarization

Ecosystem management requires not only broader sharing of information but also collaboratively work involving several actors to address problems (Slocombe 1993; Yaffee 1996; Grumbine 1997). All governmental efforts to involve the local inhabitants in the management failed, since the governmental efforts were instigated too late. A clear polarization evolved therefore between conservation efforts and the local community, not least exemplified by the early demarcation of the protected area. This turned the area into a small isolated ecosystem, excluding the adjacent areas affecting the Wadi, which inhibited adaptive ecosystem management (Gunderson 1999). The failed partnership, meeting the economic needs of the community while addressing the region's pressing environmental problems, grow with the time into local anger and incomprehension. The outcome was a polarization comparable to Pruitt and Olczak's (1995) last stage of conflict escalation - destruction – involving the demolition of physical infrastructure. The actors could clearly not agree on what actions that should be taken, which grow with time into a clear divergence and a deadlock between actors. This made the further transformation and the establishment of the

park unfeasible, as the polarization made local inhabitants opposing transformational activities suggested by other actors. All the possible links between the management board and the local inhabitants were in this way also cut off, which stalled collaborative cross-scale interactions and the essential sharing of experience and information (Imperial 1999).

5.2.4 Lack of leadership

Leadership is imperative in the polarization processes (Kriesberg 1998) as leaders may have the ability to intertwine different worldviews, building trust and managing conflicts between actors (Berkes et al. 2003, Olsson et al. 2004b, Folke et al. 2005) and thereby overcome actors resistance to transformational change. Hence, a leader has the ability to build transformational learning, which develops autonomous thinking (Mezirow 1997), i.e. when individuals realizes that old patterns of perceiving are no longer relevant and moves to adopt new ways of thinking (Boyd and Myers 1988). Something that Imad Atrash also initiated by raising awareness, preventing conflicts between local community and governmental conservation efforts as well as changing attitudes towards a new shared vision, by highlighting common goals, and thereby bridging worldviews and building trust. The barrier put up by Israel in closing the Gaza borders after the al-Alqsa Intifada, made it however impossible for Imad Atrash to continue with his bridging work. In response Imad Atrash and PWLS brought an alternative solution to the problem, handing over the implementing responsibility to Greenpeace and PARC located within the Gaza Strip. This adaptive ability demonstrated by PWLS, was the only thriving response to the second intifada identified in the empirical finding. This may support the recognized comparative advantage of NGOs, in relation to government agencies, in having more innovative, flexible and responsive organizational structures (Millennium Ecosystem Assessment 2005).

5.2.5 Fragmentized efforts

But even if PWLS found a response to the problem, the project turned out unsuccessfully in the long run because a different actor (the government) had the exclusive responsibility over the park. Actors involved in the awareness project, especially PWLS and Atrash, to whom local groups had developed trust and confidence, were excluded from the management team when the park was officially launched. So the actor responsible for implementing conservation activates, was not the actor the locals trust. This made all management activities affecting the locals very problematic, as the locals did foremost trust actors excluded from the management. As we have seen there was initially a local desire to participate in the management of the park, but the fragmentized efforts made it impossible to mobilize the diverse set of interests in the site for a transition toward ecosystem management. The lack of coherent efforts made it therefore impossible to build up the momentum required to move the system into a new phase.

5.3 The Prospect phase

5.3.1 Lacking functional feedback loops

In order to turn things to the better a new system would need to share information effectively both vertically and horizontally (Westley 1995) as well as flow up through the organization and down via management decisions (Grumbine 1997). Information did initially in the preparation phase flow between vertical and horizontal links in the social network. MedWetCoast provided also essential feedback loops between the social and ecological system, through monitoring and scientific investigations. As soon as the project was about to be launched the transformation of the organizational structure moved, however, from network guidance, spanning on different organizational levels, into a classic hierarchical management

(see e.g. Holling and Meffe 1996), incapable to maintain the necessary cross-scaling feedback loops. A management system needs, however, to be continually updated and adjusted as the complexity of system creates uncertainty (Carpenter and Guderson 2001). The extensive lack of continually flow of information both horizontal from other stakeholders and vertical within the management as well as from the ecological system (by monitoring), made the management incapable to respond and withstand external shocks to the social infrastructure. The social-ecological system became therefore highly vulnerable to external change. The final transformation failed and therefore the reserve eventually collapsed. The wasteland did never return to a wetland. In fact, a new configuration was archived, but a stable landscape further down on an undesired trajectory, even more degraded than before the transformation was instigated.

5.3.2 Returning to a more novel direction

If the components important for the preparation phase still, however, had been intact, the transformation of the social-ecological system in Wadi Gaza presumably would have taken a more novel direction. The possibilities of finding a common ground between the polarized actors had for example been greater if the key leader and his bridging work had been involved in the management, which had decreased the polarization as well as facilitated the contacts with the locals in the decision-making. Instead of providing ready-to-use plans for ecosystem management, the role of the central authorities should have been to provide funding and to form legislation to enable arenas where self-organization processes for collaborative learning could have taken place (Berkes 2002; Olsson et al. 2004a; Hahn et al. 2006). And if a co-management (Carlsson and Berkes 2005) had been present the system would have had a more likely response to forthcoming, as the information would flow through parallel systems simultaneously by the highlighting of problems in different domains (Westley 2002; Folke et al. 2005). The indigenous knowledge system, a memory of long-term social-ecological adaptations to dynamics and change (Berkes and Folke 2002), could for example clearly have been advantageously used in the management, as local residents can provide early warnings of environmental change (Olsson et al. 2004a). To enable local people to be participants in ecosystem management rather than managed as subjects, the government should, however, not only transfer part of the power to other actors but change their role from “authoritative allocation” to the role of the “activator” (Eising and Kohler-Koch 2000) and focus on “framed creativity” as referred by Folke et al. (2003).

A big share of the responsibility for the final transition would then return to the social network, as in the more successful preparation phase, where activities moved freely between centralized and decentralized actors. Social networks do not replace centralized management. As shown in Kristianstads Vattenrike (Hahn et al. 2006) and Everglades (Gunderson 1999) these flexible networks can complement the authority where formal networks often fail, by for example changing norms among concerned interests instead of being dependant on the government controlling enforcements. Since the social networks reduce the transactions cost for collaboration and conflict resolutions, in relation to authority legalisation, through providing social incentives for stakeholders to invest in building trust, identification of common interests, and resolving conflicts (Hahn et al. 2006). Social networks make it also easier to avoid following the customary often unsuccessful response paths (Stubbs and Lemon 2001; Tompkins and Adger 2004). As social networks make people feel freer, in the words of Olsson and colleagues (2006); “to develop alternative policies, dare to learn from each other, and think creatively about how to resolve resource problems.” The different nodes of expertise in the former social network, which formulated the strategy and thereby attracting financial support to Wadi Gaza, could for example have been drawn together at critical times

to find solutions to forthcoming problems in Wadi Gaza and thereby enhanced the adaptive capacity of the social system.

5.3.3 Adaptive co-management under stress

The alternative direction that has been addressed above includes a return to the components important for the preparation phase; a key steward and a social network, capable of providing a collaborative, flexible, learning-based platform shared across organizational levels; a management structure also referred to adaptive co-management (Folke et al. 2003, Olsson et al. 2004a). However, the capacity of communities to self-govern their ecosystems cannot be assumed (Olsson et al. 2006). Some of the critical components identified as hinder in chapter five towards transformation into a more self-organizational structure, would be impossible to overcome in Wadi Gaza. First of all, a returning of the former social network and key steward into the management would today be impossible. People located in the West Bank, among them Imad Atrash, highly involved in the preparation phase is today prohibited from entering the area. Secondly, it is difficult to establish co-management in conflict areas as the unstable context changes human priorities and interests towards realizing basic needs. In Maslow Pyramid of Human Needs (1970), he puts emphasis on the hierarchy of human needs, based on seven hierarchical steps, stating that some are more urgent than others. Safety and security are the second step, just above the biological requirements, while belonging, culture, creativity and self-actualization are further up on the hierarchy of needs. Maslow argue that an individual looking to meet needs for security or food will not be looking to meet needs of education, participation or problem solving. Only when lower needs on the Pyramid are met, efforts towards meeting other needs will arise. This impedes that involving local people in co-management is very unlikely in Wadi Gaza, or as Abd Rabou explains: “I have met many local people that have been injured or have relatives getting killed by the Israeli soldiers in the area close to the eastern boarder when they have hunted birds or cultivate land [...] You know, you can’t ask a person who has seen his son or daughter been killed in front of his eyes to conserve nature”.

Mermet (1991) claims that wetland management should not be a single actor process, but a function of many actors that collectively in some form are striving to control the wetland. It is thus very problematic to draw together a broad platform of actors, social networks, and institutions under instability and insecurity brought by conflicts. An alternative direction of the transformation in Wadi Gaza towards an adaptive self-organizing process, with high adaptability, would therefore probably be unfeasible due to the unstable situation. So it could be argued that even if the hierarchal management failed to establish a resilient social-ecological system, no comprehensive alternatives are/were available to a top-down management. Bodin with colleagues (2006; Levin 1951) argue that a high degree of centrality, including few actors could be rather conducive in times of change and surprise as it facilitates coordination of actors and resources. Management of natural resources under instability is, however, not unproblematic for centralized actors either as conflicts tends to move focus to social issues alone and break internal communication between governmental bodies.

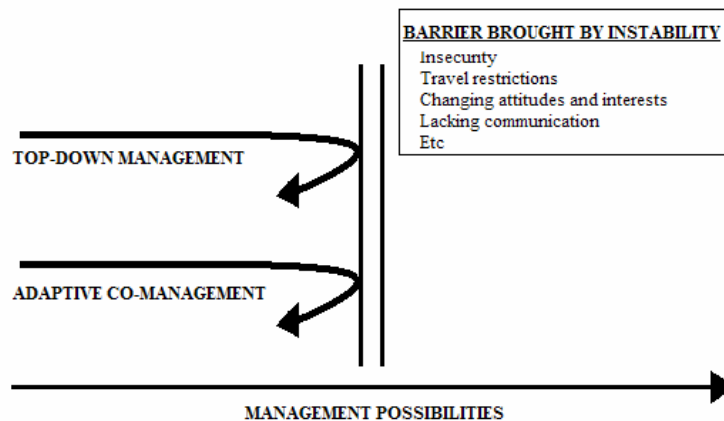


Figure 4. A visual diagram of how management tends to fail in areas plagued by instability. As coordination problems within the management are difficult to avoid during disorder; central management risks losing internal communication and network guidance management will meet difficulties to bring stakeholders together. Simultaneously instability and conflicts tend to move focus into social issues alone and shift people's interest towards meeting more basic needs.

In addition conflicts tend to breed unavoidable mismatches between the scale of management and the scale of the ecological process (Cumming et al. 2006). In this case, the conflict between Israel and Palestine hinders communication and information flow between the downstream and upstream actors (MedWetCoast 2003). The management of Wadi Gaza is therefore incapable to respond upon changes upstream, shortly reaching downstream, which deteriorates the feedback loops between the ecological and social system and the response capabilities even further.

6. Conclusion

This chapter is divided into three parts. First the contribution is presented followed by an answer to the research questions. The chapter is closed by reveal of the further impacts on the resilience theory.

In this thesis the rise and fall of an organizational structure in a wetland landscape of the central Gaza Strip has been analyzed, with a critical focus on factors that influence shifts in the social features of management systems. To lift the findings the dual structure of transformability has been used, isolating the rise of the organizational structure into a preparation phase, and the fall into the transition phase respectively. The concluding findings are the first step in improving our understanding of social-ecological system in areas plagued by social upheaval.

6.1 The preparation phase

The preparation was successful in the sense that all planning towards the establishment of the first national park for the Palestinian people did more or less follow a desired direction. Four factors have been identified essential in the analysis for the preparation phase; a social ecological system in need of a new configuration; a key individual with a vision; the emergence of a social network and a strategy; and finally a window of opportunity and financial support.

6.2 The transition phase

The transition phase towards a desired new stability was, however, unsuccessful, since the new configuration that arose was not resilient, incapable of withstanding external shocks to the social infrastructure. When a disturbance hit the new configuration the system collapsed

and even moved further down on an undesired trajectory towards the loss of ecosystem services. The transformation of a wasteland into a wetland failed. Five factors have been identified in the analysis preventing the final transformation of the social ecological system; dependence on external support; top down-management; polarization and mistrust; lack of leadership; and fragmented efforts.

6.3 Ecosystem management under stressed conditions

The use of the theoretical tools of resilience including transformability and adaptability allows us to move away from isolated explanations on single factors alone (see e.g. Hardin 1968; Clark 1973; Holling and Meffe 1996; Adger and Lutrell 2000; Alroy 2001) into a more holistic understanding of social ecological systems spanning on further scales of time and space. The thesis has shown that by analysing different phases of transformation towards a new configuration and the adaptive capacity of the social system an alternative more in-depth understanding of unsuccessful resource management can be achieved.

The transformation of Wadi Gaza was initially striving successfully towards the establishment of a national park, through the cooperative involvement of a key steward, a social network and donors. In particular, this thesis has shown the importance of highlighting social and ecological problems as intertwined, which may evolve in an innovative social network, when trying to incite donors with the importance of conservation. This corresponds to the transformative functions ascribed to social networks and a key individual (see e.g. Folke et al 2005; Olsson et al 2006; Hahn et al 2006; Gunderson et al 2006), facilitating self organization process through bringing down transactions costs and make cooperation easier.

When the social network and the key leader, however, were excluded from the management, the system become very vulnerable, as the management became incapable to incorporate flow of information into the management system from other levels. Since the transformative cooperative functions of a social network and the bridging transformative attributes of a key leader were lost. This impedes that social ecological system depending on few transformative factors in the form of social networks or key stewards, tends to be highly vulnerable.

The presence of transformative features can not be assumed. Even if the transformation would have taken another direction involving the social network and the key steward in a co-management system, the transformation and the reserve presumably would have collapsed anyway. In this case, the key leader once involved in the project is prohibited to visit the area due to travel restrictions, which also makes it challenging to gather a social network. Especially the involvement of local people is problematic, as their interests tend to change focusing on more basic needs than factors essential for adaptive co-management, i.e. participation, education and problem solving, in times of insecurity (Maslow 1970). This concludes that establishing self-organized management requires a healthy civic society under stability, not constrained by social disorder or conflicts, and is therefore probably as insufficient as top-down management has shown to be in this case of social instability. Thus, it's for all management system complicated to uphold communication and the essential flow of information between nodes under social instability.

Management of natural resources in unstable areas needs to be further investigated, as to formulate comprehensive suggestions on how to generate resilient social ecological systems and thus secure the productiveness of ecosystems in areas plagued by social disorder. Especially considering that the location of these unstable areas are often recognized to be under additional risks posed by climate change (IPCC 2007).

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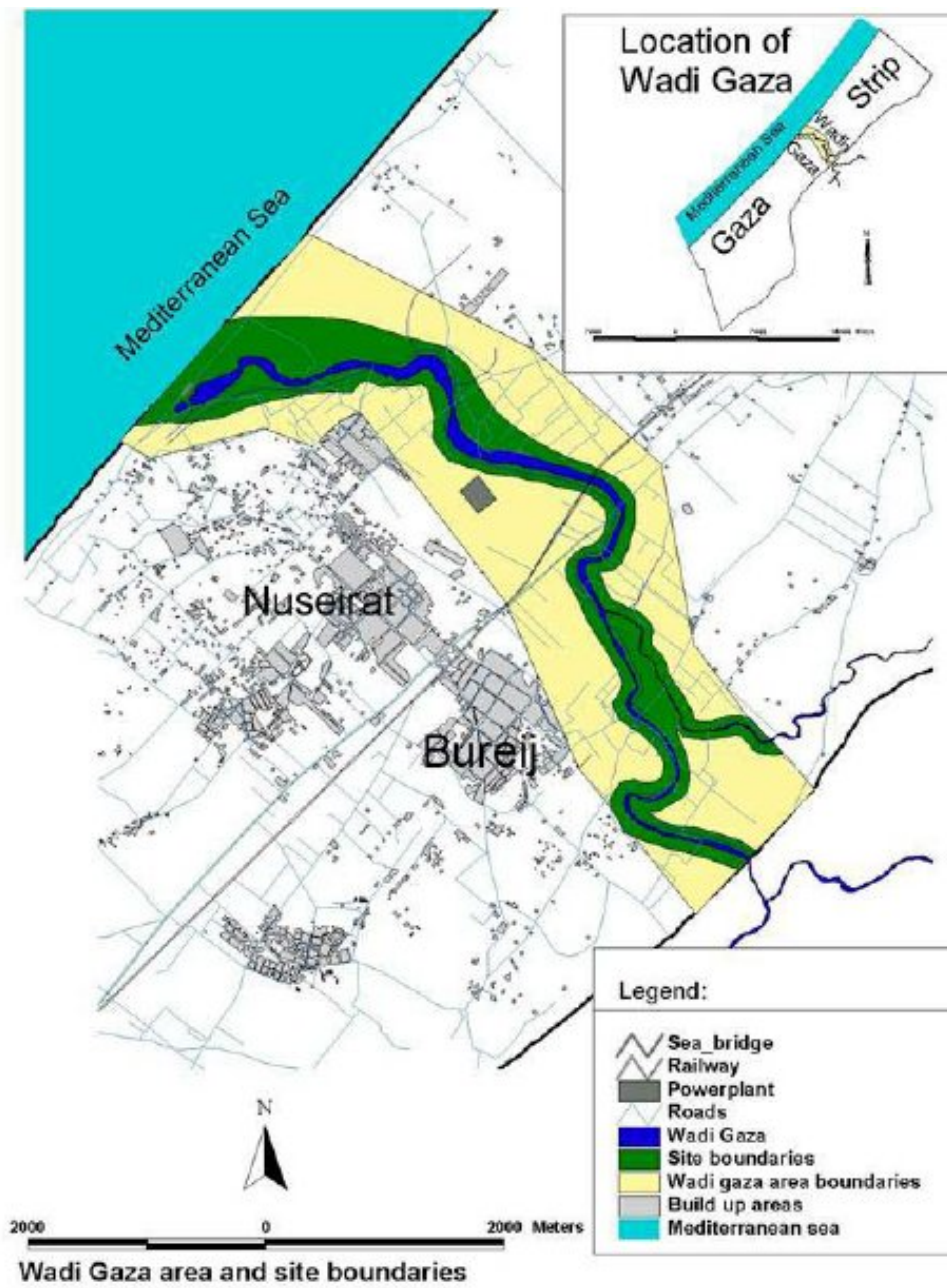
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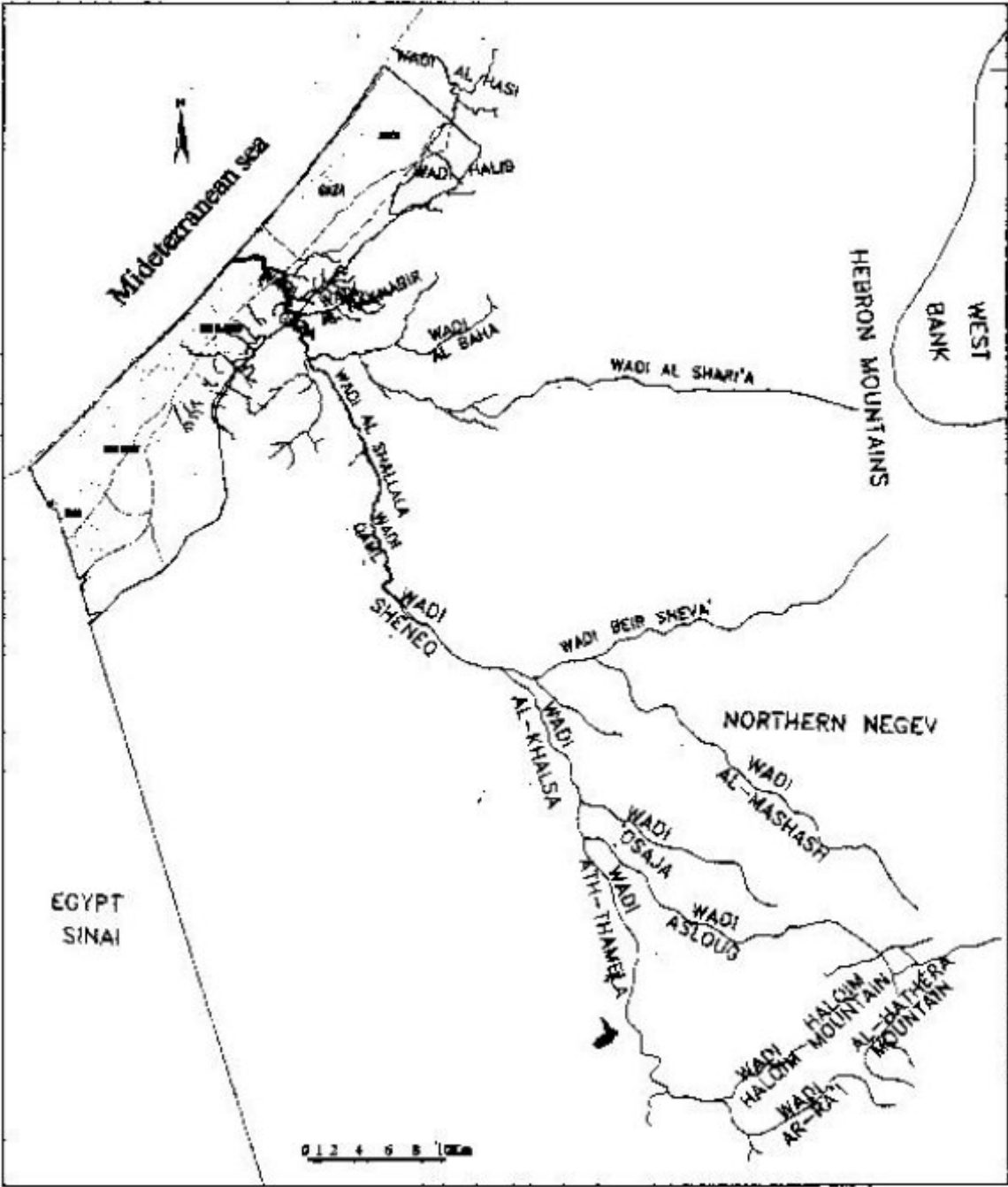
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Boundaries of the Wadi Gaza bed



(Source: MedWestCoast, 2003)

The catchment area of Wadi Gaza



(Source: MedWestCoast, 2002b)

Interview guide

Main Question:

Which factors was critical in the rise and fall of the Wadi Gaza reserve?

General questions:

Please firstly describe in what way you came in to contact with the Wadi Gaza project?

The three different themes [example of questions]:

The preparation phase

- **In your opinion what factors made the park possible?**
- How was the area first approached?
- Was there any networking (cooperation) and bridging between different actors; NGOs, locals, national and International agencies during the meetings?
- In what way did the network came about?
- What was the outcome of the different workshops and meetings?

The planning phase

- What role did the different actors play in the establishment of the park?
- Who had the responsibility of the different projects?
- Was it decided in a democratic way among the stakeholder who should have the responsibilities?
- Who was involved in the creation of the management plan?

The transition phase

- What was the outcome of the different projects?
- Did conflict views appear during the implementation phase of the projects?
- Was there any trust building and conflict resolution between different actors during the implementation?
- **In your opinion what factors or mechanism made it difficult to establish a reserve in this area?**
- Has the management plan of Wadi Gaza, made by MedWetCoast, become fully implemented, if not why?
- Do you think that the breakdown is most concerned to the structure of the project (the management plan) or a lacking implementation of the project?
- Is there any hope today to re-establish the reserve?

Annex D



Questionnaire on Wadi Gaza

This questionnaire presents eleven questions related to Wadi Gaza, with particular focus on the management of the area. The answers may be valuable in understanding why the reserve collapsed, as to assist the Palestine Wildlife Society in their further work and facilitate the reestablishment of the national park. Your name or the single answers that you may contribute with will be treated confidentially and not become public. However general patterns generated from this questionnaire will possibly be used in a potential Master Thesis. If there are any problems or questions what so ever, you are most welcomed to contact the author of this questionnaire, Nils Johansson, by;

E-mail: niljo447@student.liu.se or pwls@wildlife-pal.org

Telephone: 059-8101570 (mobile). 02-277-4373 (PWLS office).

Fax: 02-277-4373 (PWLS office).

Please circle or mark the best option(s)

1. Who do you think identified the alarming environmental degradation of Wadi Gaza in the first place and provided the ecological knowledge?

Please circle or mark the best option(s).

1. Key individual(s)
2. The International society (e.g. UNDP or USAID)
3. The Palestinian Authority
4. The Local Authority/municipally
5. Non governmental organizations
6. The Universities
7. Other: _____

Comments: _____

2. In your opinion who came up with the solutions and the plans for ecosystem management and ecological restoration?

Please circle or mark the best option(s)

1. Key individual(s)
2. The International society
3. The Palestinian Authority
4. The Local Authority/municipally
5. Non governmental organizations
6. The Universities
7. Other: _____

Comments: _____

3. Who do you think founded the project and took the responsibility for implementation of ecosystem management?

Please circle or mark the best option(s)

1. Key individual(s)
2. The International society
3. The Palestinian Authority
4. The Local Authority/municipally
5. Non governmental organizations
6. The university
7. Other: _____

Comments: _____

4. In your opinion who/what made the establishment of the Wadi Gaza reserve possible?

Please use the following scale: 1 = none; 2 = weak; 3 = considerable; 4 = strong.

Please circle or mark the best option(s)

Factor/mechanism	Importance
Key individuals and leadership	1 2 3 4
International efforts (e.g. by UNDP or USAID)	1 2 3 4
The Palestinian Authority	1 2 3 4
The Local Authority/municipalities	1 2 3 4
Non governmental organizations	1 2 3 4
Researchers at Universities	1 2 3 4
Other: _____	1 2 3 4

Comments: _____

5. Do you consider that bridging efforts (cooperation) between the different actors (NGOs, international, national and local) have been present?

Please circle or mark the best option

1. Very much
2. Much
3. Some
4. Little
5. Very little

Comments: _____

6. Or do you feel that it is/was polarization among different actor groups, only pursuing their own interests? (e.g. actors cannot agree on what actions should be taken)

Please circle or mark the best option

1. Very much
2. Much
3. Some
4. Little
5. Very little

Comments: _____

7. Did conflict views appear during the implementation phase of the management plan? (e.g. between economic development and conservation?)

Please circle or mark the best option

1. No
2. Yes, between: _____

Comments: _____

8. What factors or mechanism made it difficult to establish a reserve in this area and prevented a further implementation of the management plan?

Please circle or mark the best option(s) and describe your thoughts.

Please use the following scale: 1 = none; 2 = weak; 3 = considerable; 4 = strong

Factor/mechanism	Importance
The Israelian occupation, by: _____	1 2 3 4
Lack of information on the upper stream of Wadi Gaza (located in Israel)	1 2 3 4
Poor institutions and governmental legitimacy (not able to enforce laws)	1 2 3 4
Public ignorance and/or lack of concern	1 2 3 4
Dependency on external support and limited self- organization	1 2 3 4
High population pressure	1 2 3 4
Poor cooperation with local and Indigenous people	1 2 3 4
Limited collaboration between non-state and state actors	1 2 3 4
Other: _____	1 2 3 4

Comments: _____

9. Would you say that the collapse of the reserve is foremost connected to internal aspects or external aspects?

Please circle or mark the best option

1. Only internal aspects (e.g. discontented management plan, lack of cooperation)
2. Mainly internal aspects
3. No alternative more central than the other
4. Mainly external aspects
5. Only external aspects (e.g. population density, occupation)

Comments: _____

10. Have there been any efforts to reconcile the different clusters of actors for the purposes of identifying a common ground and staking out a new direction for management?

Please circle or mark the best option

1. No
2. Yes

Comments: _____

11. And finally, choosing an optimistic approach, what are your visions for the area?

please describe your potential vision:

Thank you very much for the help

Please return your answers by either fax or e-mail, as quick as possible to Nils Johansson by:

Email: niljo447@student.liu.se or pwls@wildlife-pal.org

Fax nr: 02-277-4373

If some parts of your answers appear interesting I hope that I will have the possibility to get back to you, for further clarification.

A copy of the master thesis will be send to you when it is completed.

Your sincerely

Nils Johansson. Master student; Stockholm University. And at present volunteer at the Palestine Wildlife Society in Bethlehem.