

Stakeholder Involvement in Tourism Destination Development: A Case of Dunga Beach and Wetland, Kisumu County, Kenya

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ABSTRACT

In Kenya, tourism is the second largest source of foreign exchange revenue following agriculture; it however, faces numerous challenges of sustainability due the complex nature of tourism destinations. Tourism destinations are complex and dynamic systems that involve various stakeholders each with different understanding of same tourism system. These different perceptions can be tapped to develop a common tourism model that helps achieve the overall sustainable tourism development objective of a given destination. This paper describes participatory systems approach to develop a shared understanding amongst stakeholders of the tourism system in Dunga Beach and Wetland, in Kisumu County, Kenya. The process includes the development of a systems model that represents a holistic understanding of the interconnectedness and relationships between the various components that affect sustainable development of tourism in Dunga. The model is intended for use as a framework for enhancing ecotourism experiences by stakeholders who are service and experience providers in Dunga for the satisfaction of tourists at the site.

1.0 Introduction

A record one billion tourists crossed international borders in 2013, an event that was celebrated by the United Nations World Tourism Organization (UNWTO). The World Travel & Tourism Council (WTTC) estimates that travel and tourism accounts for 9 percent of global GDP from direct and indirect activities combined. Even when measured more conservatively, international tourism is a major source of income and cross-country linkages (UNWTO, 2014).

In Africa the tourism industry is a major sector of the economy for many countries (Hayombe, Agong, Nystron, Malbert & Odede, 2012). The four countries that benefit the most from tourism are Egypt, Tunisia, Morocco, and South Africa. A second category includes the countries of Namibia, Botswana, Mozambique, Tanzania, and Kenya (UNWTO, 2014).

In Kenya, tourism is the second largest source of foreign exchange earner following agriculture. The country's vision 2030 identifies tourism as key sector in realization of its goals and objectives. Promotion, conservation and sustainable development of tourist destination has been considered crucial due to the complex nature of most tourists destinations in Kenya (GoK, 2011)

A tourism destination is a complex and complicated ensemble of diverse components of interrelated economic, social and environmental factors, all deeply connected among themselves (Schianetz, Jones, Walker, Lockington & Wood, 2009). It is a changing dynamic system, in which sparking events, internal or external, natural or human, can challenge existing configurations, normal operations or even the very existence of the system and can dislodge it from an equilibrium state towards different and erratic evolutionary paths (Baggio, 2013). All this with a very little predictability, which makes problematic the governance of the system and the design of strategies for improving the overall effectiveness and efficiency of both the whole and its components (Schianetz *et al*, 2009).

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Tourism products and experiences may be considered collections of components such as accommodation, transport, attractions, hospitality among others where the relationships between the different elements are difficult to define and analyze in aggregate form due to the variability in which different customers arrange them throughout their trip (Baggio, 2013). A number of models, ideas and methods have been used to study tourism systems (Schianetz et al., 2009), but many often raised problems in the capability of fully describing the complex and dynamic socio-economic environments of tourism. In particular, they have had little success in providing satisfactory insights into the possible development paths of such systems (Odede, Hayombe, Agong & Ananga, 2013; Farrell & Twining-Ward, 2004).

One useful approach to the study of the tourism phenomena is to focus on tourism destinations. These are the geographic locations where tourists spend most of their time when travelling. A destination contains “a critical mass of development that satisfies traveler objectives” (Baggio 2013), and thus offers a tourist the opportunity of taking advantage of a variety of attractions and services. Many scholars consider it a fundamental unit of analysis for understanding of the whole tourism phenomenon, even if difficult to define precisely and problematic as a concept (Framke, 2002).

A destination has the properties of a system: an organized assembly of elements or parts (components) connected to each other with some defined relationship, and having the general objective of accomplishing a set of specific functions, or achieving particular goals (Baggio 2013; Maani & Cavana, 2007; Kain, 2003). The systemic approach provides a broad framework that allows different perspectives to be used flexibly in the study of tourism, rather than assuming rigid predetermined views. It enables an understanding of the broad issues that affect tourism and takes into consideration the relationships between its different components (Page & Connell, 2006).

Identification of tourism destinations as systems is a useful analytical approach, but stimulates further questions on what type of system it is, what are its components and how their interactions affect the overall dynamics of the system. Baggio, 2013 considering the deficiencies and the unreliability of many predictions and forecasting methods for tourism, called for the use of alternative ways to explain tourism dynamics, and proposed the adoption of a chaos and complexity framework. Since then a growing strand of literature has recognized the complexity characteristics of tourism systems noting the non-linearity of the relationships that connect the different companies and organizations, and the response of the various stakeholders to inputs that may come from the external environment or from what happens inside the destination (Haugland, Ness, Gronseth, & Aarstad, 2011; Baggio, 2008). Obviously, not all destination systems share exactly the same characteristics and behaviours, and diagnosing the extent to which a destination may be considered a stable, a complex or even a chaotic system can be of great interest not only from a theoretical point of view, but also because it may provide crucial insights into the possibility of governing and steering the destination towards a desired evolutionary path (Baggio & Sainaghi, 2011; Baggio, Scott, & Cooper, 2010).

Study Objective

1. To assess different mental models of stakeholders constituting ecotourism system in Dunga.
2. To uncover the main characteristics of the system and to highlight a new way to understand the dynamics of tourism development in Dunga Beach and wetland, an upcoming tourism destination.

2.0. Methodology

The methodology used in this study was the systems thinking approach. This approach includes identifying key stakeholders from relevant sectors at different levels, defining initial issues, building consensus, and group model building (Maani, & Cavana, 2007). In Dunga beach and wetland, the key stakeholders included the local community, tour guides, county government, fisheries, tourism department and craft makers.

The study used the qualitative approach of data collection over a six-month period between July 2013 to February 2014 to gather the data for this study. Key informant interviews, focus group discussions and observations were used. An ecotourism conference, Dunga test tours and fish night organized by Kisumu Local Interaction Platform (KLIP) provided important arenas for the further interaction with the stakeholders to identify key issues, drivers and inhibitors that assist or impede sustainable tourism development of tourism in Dunga and Kisumu region.

The identified issues created a point of departure for the stakeholders who participated in the consensus building stage to develop a conceptual tourism system model for Dunga. In this stage, diverse and sometimes conflicting views about the important factors to be included in the system model were discussed in a stakeholder workshop. Causal Loops Diagrams were generated to show relationships and to identify feedback processes.

2.1 Developing Causal Loop Model

Causal loop diagrams (CLDs) depict the relationships between entities and the feedback processes of the system. Feedback processes mainly refers to the closed loop of causal effects. Given the ability of Causal Loop Diagrams in addressing dynamic and complex systems, it was considered as a proper analytic tool for this study.

The model illustrates the major loops that can affect the performance of tourism system to pave the path for exploring the critical decision factors that significantly influence the experience performance of the tourist destination. The Causal Loop diagrams depict the general status of tourism system in Dunga.

The relationship amongst the issues identified was elicited through a stakeholder workshop conducted in Dunga. The workshop comprised of forty (40) participants from six (6) groups of stakeholders; tour guides, craft-makers, beach management unit, local community, government agencies and non-governmental organizations operating in Dunga. About 80% of participants in the workshop were conversant with system thinking and system dynamic concepts as they had attended a workshop on System Thinking held in Dunga Beach conducted by the researchers. The remaining 20% of the participants had not had any knowledge in systems thinking.

These stakeholders were therefore given a general introduction to system thinking before the workshop. The workshop was crucial in identifying important component of the system and establishing general inter-relationship between these components. The causal loop diagrams for Dunga tourism system presented below were then refined based on the outcome of the workshop.

2.2 Study Area



Figure 1: Location of Dunga in relation to Kenya and Africa
Source: Falted, Reddin & Wanga, 2012

The study will be conducted in the Kenyan part of Lake Victoria at Dunga beach and wetland. Dunga is a beach and wetland situated about 10km south of Kisumu town on the shores of Lake Victoria of Winam Gulf, Lake Victoria. The wetland covers an estimated area of 500ha and an altitude of 1130m. At the western limit is a beach, used as a major fish landing site. Papyrus (*cyperuspapyrus*) stands stretch south-eastwards along the shore for about 5km, in a strip that varies in width from about 50 to 800m. A number of streams drain their water into the lake through the wetland, the main one being Tako river.

2.2.1 Birds of Dunga and the Dunga wetland

This site is one of the most reliable sites in Kenya for the scarce and threatened papyrus yellow warbler. It is part of the Nanga region and is an informal settlement with rural character (Hayombe, Agong, Nystron, Malber & Odede, 2012; Falted, Reddin & Wanga, 2012). Numerous endemic bird species characterize the adjacent wetland, creating an attractive destination for educational tours. The wetland is predominantly papyrus thus creating a distinctive habitat for papyrus specialist birds such as the Yellow Warbler, which is very hard to find in other areas of Kenya. Eight of Lake Victoria Basin biome species have been recorded here, it is especially important for all papyrus endemics Papyrus Gonolek, White-winged Warbler and Papyrus Canary, Carruthers's Cisticola (Falted, Reddin & Wanga, 2012) Other notable wetland birds found on site include the kingfisher, little egret and hammer kop.



Plate 1: Wetland birds in Dunga
Source: Wanga, 2014(Unpublished)

The wetland also provides a perfect fish breeding grounds for the fish in Lake Victoria, and hosts a breeding area for hippos. The local community in Dunga exhibits a rich culture and heritage displayed through songs and dances, traditional food and dressing pattern, (Odede, Hayombe, Agong & Ananga, 2013).

Dunga wetland though a home to these unique species of birds and animals, it is under constant threat of degradation due to human activities. The high level of dependence on papyrus has contributed to a general decline in the area of available papyrus. Over 65% of papyrus users along the Dunga wetland perceived a decrease in the size of their wetlands over the last decade (Morrison, K'oyooh, & Harper, 2010). Herdsmen cut papyrus flower heads to feed to their livestock, particularly during dry seasons when wetlands are the only available source of green vegetation. Farmers also clear the swamp (through cutting or burning) during low lake levels when previously inundated fertile soils become accessible in order to cultivate land they regard as contiguous with their own plots.

A common cause of wetland degradation, irrespective of livelihood strategy, is seemingly the reliance on papyrus as a source of fuel either on a daily basis or when charcoal, firewood or other options are unobtainable (Morrison *et al* 2010). The vast majority of the local residents use the plant stems (in some cases this represents waste material discarded during commodity production), but a large proportion (69%) also use the plant roots (being woodier and thus burning more efficiently) which greatly reduces the regenerative capacity of the plant (Morrison *et al* 2010).

According to LVBC 2011, wetland coverage in the Lake Victoria basin has continued to shrink and their uses and services have deteriorated, mainly through conversion into human settlement, drained for agriculture especially of rice, sugarcane and grazing. In Nyanza province, the acreage brought under cash crops, food crops and livestock production especially in the flood plain has been increasing steadily in the region over the years.

2.2.2 Dunga food festival and fish night

Dunga tourism players have been working in collaboration with Kisumu Local Interaction Platform under MISTRA Urban Futures; to develop a sustainable tourist destination in Dunga. In the year 2013, a Dunga fish night and food festival was started to incorporate local community in showcasing traditional foods, songs and dances as a way of branding the site as a sustainable tourist destination.

Dunga community is predominantly Luo, their favorite meals include fish especially *ngege*(tilapia), *obambo* (sun-dried tilapia) and *mbuta* (nile perch) usually accompanied with ugali (called *kuon* in Dholuo) and vegetables.



Plate 2: traditional foods sampled during the Dunga fish night
Source: Wanga, 2014(Unpublished)

Many of the vegetables eaten by the Luo were shared after years of association with their Bantu neighbors, the Abaluhya and the Abagusii. Traditional Luo diet consisted of *kuon* made of sorghum or millet accompanied by fish, meat, or vegetable stews. During the Dunga fish night a number of traditional Luo cuisines were sampled, with visitors getting a taste of various types of traditional dishes. These include *ngege*(tilapia), *Aliya* (sun-dried meat), *omena* (sardines), *aluru* (quails), *obambo*(sun-dried tilapia), *kuonaluanga* (ugali prepared in fermented milk), *Obuolo* (mushroom,) and *andsewewe* (pumpkin leaves).

2.2.3 Hippos of Dunga

Hippo viewing is one of the key attractions in Dunga. Boat tour package provides visitors an opportunity to view hippos at close proximity. The boat tour leads to the Hippo Point, a 600-acre open viewing area on Lake Victoria. It is a viewing point for its unobstructed sunsets over the lake and the hippos.



Plate 3: Hippo swimming in Lake Victoria, Dunga, Kisumu
Source: Wanga, 2014(Unpublished)

3.0 FINDINGS

The main issues identified were: (i) poor infrastructural and tourism facilities such as roads, eco-lodges, tour boats, safety gears and insufficient recreational activities; (ii) an increasing impact of tourism development on the beach environment in terms of water pollution, indiscriminate waste disposal within the beach and in the wetland, biodiversity degradation and noise pollution as a result of unrestricted access to the beach by motor vehicles; (iii) limitations of natural resources such as clean water, land ownership, degraded wetland; (iv) increased poverty level; (v) unskilled tourism service providers such untrained tour

guides, efficient and well trained safety personnel and effective marketing strategies. These main issues were grouped into three main categories namely tourism economy, social-demography and natural resources as summarized in Table 2.

Table 2-Key issues for Sustainable Development of Tourism in Dunga Beach, Kisumu

Tourism Economy	Natural resources	Social-demography
Poor tourism infrastructure: poor road to Dunga, lack of accommodation, clean water, ineffective waste disposal system and unsafe tour boats	Insufficient land for recreation facilities	Low level of education
Pollution in water and dumping of waste in beach space	Encroachment into the wetland	Lack of skilled tourism service providers (tour guides, marketers, rescue teams)
Diminishing lake resources (declining fishing potential)	Loss of biodiversity	Social challenges such as drug abuse, prostitution
Crop failures and reduced livelihood sources	Unpredictable rain patterns	

3.1 Tourism Economy and Natural Resource Loop

Through the interactions among the stakeholders during the workshop, the stakeholders noted that an increase in the number tourists in Dunga corresponds with the demand for the expansion of infrastructure such as roads, accommodation, water supply, electricity and solid waste disposal. It also directly affects tourism facilities such as recreation facilities, restaurants and transport systems. This leads to increasing land use pressure as a result of development and also competition for natural resources.

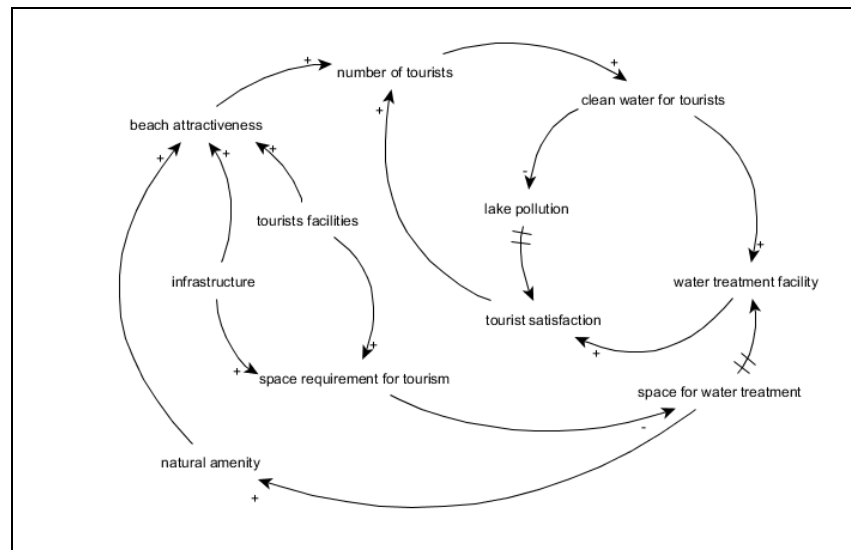


Figure 3: Interrelationship Between Economy and Natural Resources in Dunga System
 Key: + (same direction), - (opposite direction),
 Source: Wanga, 2014(Unpublished)

3.1.2 Socio-demography and Natural Resources Loop

Development of tourism in Dunga creates employment opportunities through variety of tourism related services such tour guiding, restaurants operation, water transport operation and market to craft and fish traders within the beach. As a result the population of the beach increases, which leads to an increase in the level of waste and pollution, which in turn has a negative impact on the quality of water and welfare of the local people. This is illustrated in the Causal Loop Diagram below developed by the stakeholders during the systems workshop in Dunga.

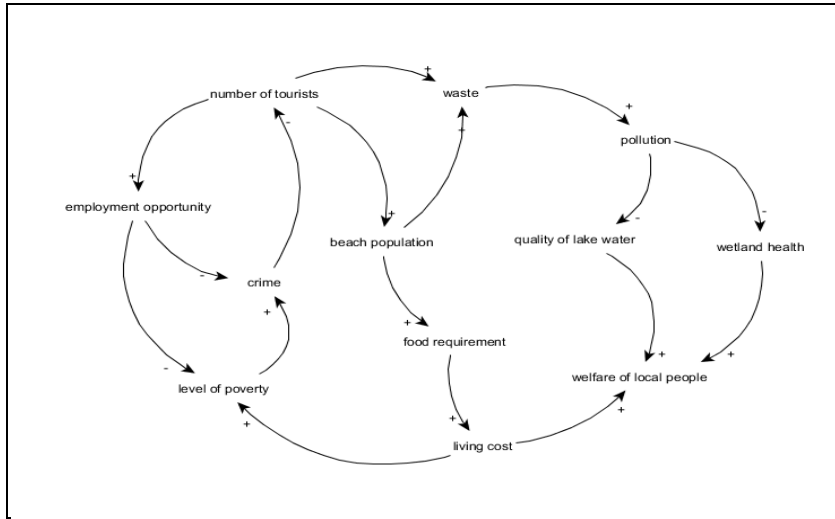


Figure 4: Interrelationship Between Socio Demography and Natural Resources in Dunga System
 Key: + (same direction), - (opposite direction),
 Source: Wanga, 2014(Unpublished)

Increasing food demand is another factor in Dunga that affect the welfare of the local people. This is because it causes an increase in the cost of living, the local people ascertain that its increasingly becoming difficult to afford fish because of increased demand.

3.1.3 Socio-demography and Economy Loop

Increasing tourist numbers in Dunga will demand more of natural products that encourage local craft makers to exploit wetland and lake products indiscriminately such excessive papyrus harvesting, indiscriminate fishing practices. Subsequently the attractiveness of the Beach and the wetland is degraded. However, it also creates employment opportunities for local residents that have positive impact on their welfare when visit arrive at the beach in big numbers. The existence of tourists and other outsiders influences social evils such as drug taking and prostitution. This affects negatively the welfare of the local people.

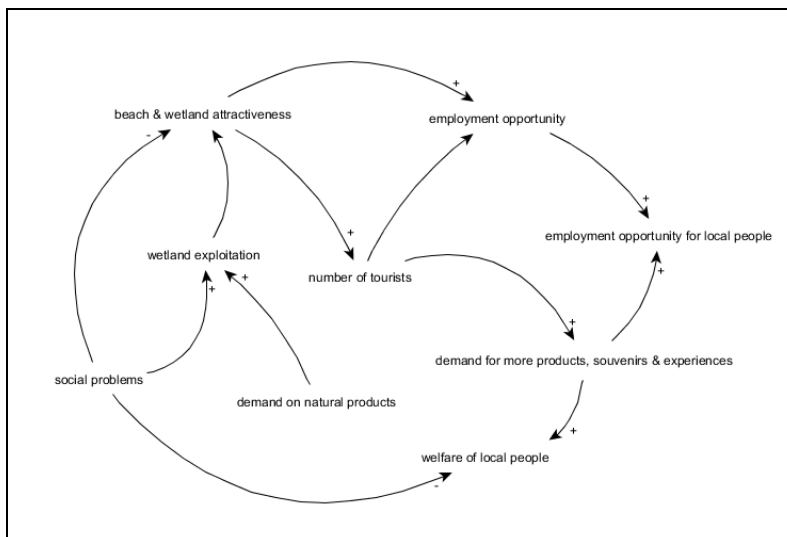


Figure 5: Interrelationship Between Socio Demography and Economy in Dunga Tourism System
 Key: + (same direction), - (opposite direction),
 Source: Wanga, 2014(Unpublished)

3.1.4 Causal Loop Diagram of the Tourism System in Dunga Beach and Wetland

The interrelations between sub-systems of the tourism on the beach and the wetland were ascertained during the workshop held in Dunga in June 2014. Among a number of variables within sub-systems identified during the workshop, only main variables are included in this model.

The resultant conceptual model for Dunga Tourism System presented in Figure 6 provides a fair idea of the integration of the mental models that were shared and integrated by the relevant stakeholders on tourism development in Dunga beach and wetland. The model building process was a significant exercise for the participants who considered the discussion groups, individual interviews and workshop as a forum for them to present their ideas. There was a clear feeling amongst the stakeholders that their experiences and knowledge were regarded as valuable. They could directly experience the addition of many variables and removal of others from the model they have helped to create, and the stakeholders took strong ownership of the model.

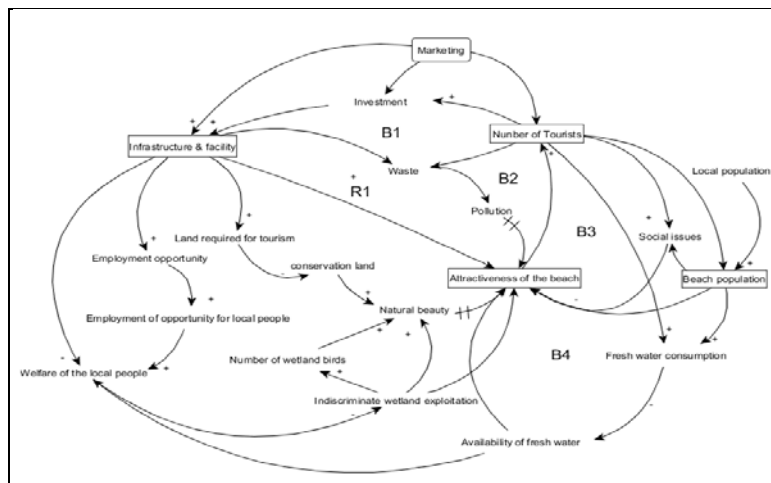


Figure 6: Conceptual Model for Tourism System in Dunga and Key Leverage Points

Key: + (same direction), - (opposite direction), // (delay), R (reinforcing loop), B (balancing loop)

Source: Wanga, 2014(Unpublished)

A number of leverage points for systemic interventions were also identified during the workshop. Leverage points are places within a complex system where a small shift in one item can produce big changes in everything (Meadows, 1999).

3.1.5 Identified Leverage Points

A leverage point is a place in a system where force can be applied. A low leverage point is a place in a system where a small amount of force causes a small change in a system behavior. A high leverage point is a place in a system where a small amount of change force causes a large amount of predictable, favorable response (Meadows, 1999). The systems workshop provided a crucial platform where the stakeholders interacted and identified five high leverage points to enhance tourism experiences in Dunga beach and wetland. The five includes the following:

3.1.5.1 Attractiveness of the beach

Attractiveness of the beach was also identified as a key intervention point with the potential of creating a major impact visitor experience in Dunga. Attractiveness of the beach, during the workshop was considered a crucial element for enhancing ecotourism experiences because of its direct influence on the number of tourist to the site. Clean beach environment, friendly and hospitable local community, knowledgeable and supportive tour guides and variety of tourist products, services and extra ordinary experiences were considered key factors promoting attractiveness of the Dunga as a tourist destination.

3.1.5.2 Tourism infrastructure

The stakeholders identified tourism infrastructure as a high leverage point for ecotourism experience enhancement in Dunga. Development of appropriate infrastructure such as accommodation, built attractions, restaurants, roads to Dunga, safe tour boats, safety clothing, clean water, and efficient sewerage

services. In the Dunga tourism system diagram (Figure 6), the tourism infrastructure as an entity hugely influences the land space for tourism, welfare of the local people as well as the employment opportunities because of tourism activities in Dunga beach.

3.1.5.3 Number of tourists

The number of tourists visiting Dunga beach was considered crucial in promoting the local economy as well as improving the welfare of the local residents. It was however, noted that unchecked tourist number to the site could also pose danger to the biodiversity in Dunga especially when it exceeds the carrying capacity. The tourism stakeholders identified this element as an important leverage point from which an intervention could be invoked to promoting sustainable tourism practices in Dunga.

3.1.5.4 Beach population

The population of the beach was identified as a high leverage point. The beach population was estimated as the sum total of number of tourists to the site and the people residing and operating within the beach at a given time. The stakeholders considered the population a crucial factor in influencing the destination quality and sustainability. Social problems, demand for fresh water and food, waste disposal and management, and serenity of the local environment is significantly influenced by the beach population.

3.1.5.5 Destination Marketing

Marketing of Dunga beach and wetland was identified as a high leverage point in promoting unique ecotourism experiences in Dunga beach. Stakeholders described the underlying relationships between marketing and other components of ecotourism in Dunga beach. The systems diagram developed clearly indicate direct link between marketing and tourists numbers, marketing and employment opportunities as well the relationship that exist between marketing and provision of tourism infrastructure.

3.1.6 Identification of Feedback Loops

Identification of feedback loops provided crucial basis for the analysis of Dunga tourism system. A number of feedback loops were identified from the model.

3.1.6.1 The Dunga Tourism Growth Feedback Loop (R1)

The central tourism growth loop is significant for the tourism system in Dunga that aspires to develop a sustainable tourism destination. This loop links a number of variables; Number of tourists, investments, infrastructure and attractiveness of Dunga beach and wetland. The reinforcing loop portrays key drivers for tourism growth in Dunga.

This loop illustrates realization of an attractive beach through provision of tourism related facility and infrastructure such as road to Dunga, ecolodges, recreational facility among others. The starting point for this loop is the number of tourists to the beach. As the number of tourists increase in Dunga, the higher the amount of revenue collected and this would lead to more investment in related facility to support the growing demand.

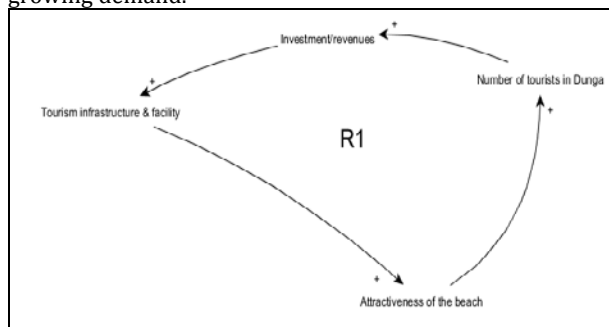


Figure 7: Dunga Tourism growth loop (R1)

It is clear that in this loop, the attractiveness of Dunga beach acts as an important driver for tourism growth since it encourages people to visit and spend time in Dunga beach. If only the R1 loop existed in Dunga tourism system, then the industry would easily reach its objective of increasing the number of tourists. However, a number of loops in the system are likely to limit the growth of R1.

3.1.6.2 Dunga Pollution Feedback loop (B1, B2)

Tourism activities apart from generating revenues to the respective destination, also adversely affect the environment. Increased number of tourists to Dunga is likely to increase the amount of waste and litter generated from the recreational activities. The pollution feedback loop in Dunga tourism model include B1 (Number of tourists, waste disposal, pollution and attractiveness of the beach; B2 (number of tourists, investment, tourism infrastructure, waste, pollution and attractiveness of the beach). Concentration of tourist numbers in the beach may lead to over consumption of water resources. The increasing number of vehicles in the beach generates more waste, increase oil leaks and carbon dioxide emission on the beach as well as increasing noise pollution at the beach.

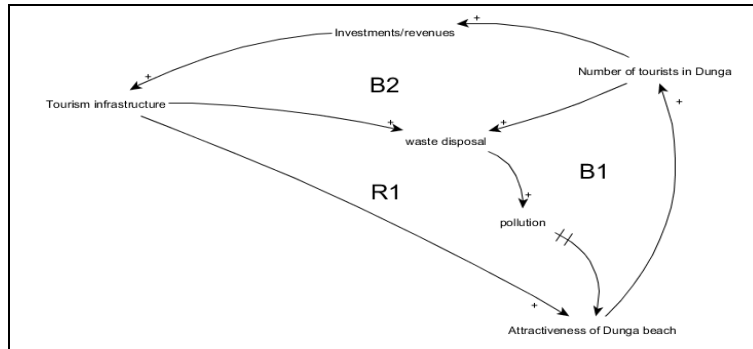


Figure 8: Dunga Pollution Feedback Loop (B1, B2)

3.1.6.3 Number of Tourists and Fresh Water Loop (B3, B4)

A shortage of fresh and quality water was identified as a possible factor that could limit the growth of sustainable tourism in Dunga beach. Quality of the water provided for the tourists both consumption and recreational purposes is critical in determining the attractiveness of Dunga beach as a tourist destination. Attractiveness of the beach influences the number tourists to the site; increased number of visitors exerts pressure on the availability of freshwater for consumption due to increased demand.

Number of tourists both foreign and local was identified as playing crucial role propagating social issues affecting Dunga as a destination. Drug abuse, prostitution, crime, child labor and HIV/AIDS prevalence are some of the issues affecting Dunga. These issues affect the attractiveness of a tourist’s destination that in turn influences the number of tourists to a destination.

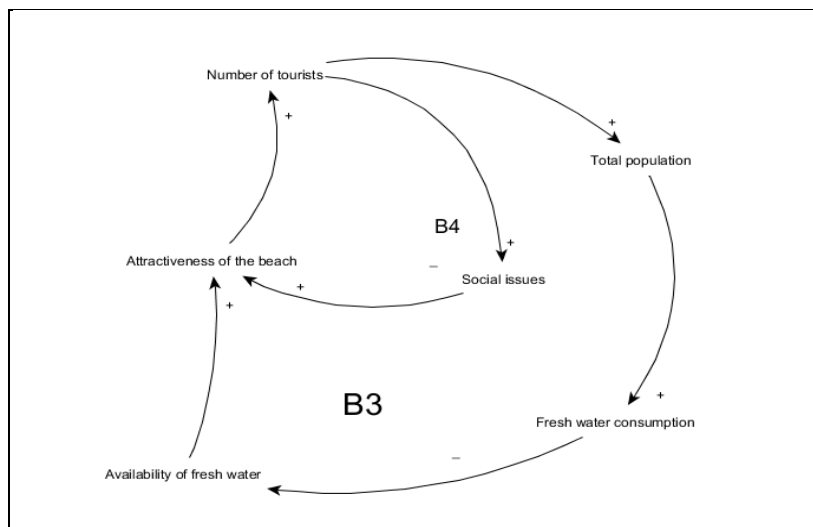


Figure9: Tourists Number and Fresh water loop (B3, B4)

4.0 Discussion

This study set out to explain how a complex and dynamic tourism system model could be developed and used as a framework for decision making and capacity development by tourism stakeholders in developing a sustainable tourism system with enhanced ecotourism experiences for the tourists in Dunga beach and wetland.

The study identified a number of leverage points, from which efforts on intervention can be placed. The leverages include: tourism infrastructure, marketing, tourists number, beach population and attractiveness of the beach. The concept of leverage points was first mentioned by Archimedes (287-212 BC) in his famous quote. Meadows (Meadows, 1999) pointed out that the leverage points are places within a complex system where a small shift in one item can produce big changes in everything. The leverage points are points of power and are the right places to intervene in a system (Baggio, 2008). Tourism infrastructure is a major concern for tourism development in Dunga, children play ground, recreational facilities, road to Dunga and safe boat rides are critical issues that Dunga requires. Baggio, 2008; Meadow, (1999) point out that Baggio, 2008; Meadow, 1999), in Dunga system, systems thinking approach was used. The conceptual model and causal loop diagram of a system was developed and validated; it revealed causal relationships between issues, and then it enabled the identification of common patterns in the system, known as system archetypes.

System archetypes are generic systems models or templates that represent a wide range of situations (Maani & Cavana, 2007). They provide high-level maps of dynamic processes and are highly effective tools for gaining insight into patterns of behavior of the system being studied (Maani & Cavana, 2007). The archetypes also provide good indications of where the potential leverage points in the system are. The identification of leverage points in this study was facilitated in conjunction with the identification of system archetypes.

In the case of ecotourism in Dunga beach and wetland, Limits to Growth, Fixes that Fail, and Tragedy of the Commons were identified. These archetypes provide captures the key dynamics of the tourism system in Dunga and helps to understand the interconnectedness and relationships within and between the components of the tourism system. Limit to growth was first introduced by Meadows (1999) who stated that a reinforcing process of accelerating growth will always be counteracted by a balancing process. This is known as a limiting (or constraining) force in the system. The generic structure of the limit to growth archetype consists of one reinforcing and one balancing loop (Maani & Cavana, 2007).

The lesson learned from this archetype is that some element always pushes the system back, so that if we do not plan for limits, we are planning for failure (Nguyen, Bosch, &Maani, 2011). In order to anticipate future problems and eliminate them before they become a threat, the growth engines and potential limiting or constraining forces need to be identified and mapped out. This implies that in the limit to growth archetype, the leverage point is not only placed in reinforcing loop, but also in the balancing one. This reminds tourism stakeholders that they should not only focus on the growth engine factors, but also take time to examine what might be limits or constraints that could push back against their efforts (Nguyen, Bosch, &Maani, 2011).

In the tourism context of the Dunga beach and wetland, most of the tourism initiatives and planning strategies have so far been on attracting more tourists to the beach, rather than the constraints or negative impacts of tourism. The reinforcing process of growth through massive outreach to schools, improved tourism infrastructure and facilities (Road to Dunga, increased tourism products and experiences, hotels and accommodation and strong advocacy for more recreational facilities) has received a lot of attention, without recognizing the constraints, such as pollution, environmental degradation and poor service quality. These constraints are a significant threat to the sustainability of tourism in Dunga beach and wetland.

The second system archetype revealed by Dunga tourism system model was "Fixes that Fail". This archetype represents a situation in which unintended, often harmful consequences follow well-intended actions (Nguyen, Bosch, & Maani, 2011; Meadow, 1999). Similar to the limit to growth archetype, fixes that fail is also composed of one reinforcing loop and a balancing loop.

The archetype is a good reflection of reductionist thinking that leads to a continuing worsening scenario. The initial problem becomes exposed as a symptom, which through reductionist thinking will only require quick-fix or short-term solution from managers (Meadow, 1999). Results will be achieved faster and initially appear to cost less to achieve. As a result, the problem symptom is temporarily diminished or removed in the short term but the quick fix solution can have unintended consequences that in the long-term may return to the previous level or even exacerbate the problems.

The “fix that fail” archetype exists in the tourism system of Dunga beach and wetland where the increasing tourist numbers have created a high pressure on tourism services. Much of the tourism infrastructure and facilities, such as good road to the beach, more recreational space, good hotels, restaurants and an outside parking space have been identified as a response to the building pressure. However, these quick-response solutions are likely to create unintended consequences that would increase environmental degradation, less resources becoming available for development and resulting in an acceleration of the pressure on tourism resources.

This approach will further exacerbate negative effects on the tourism industry such as pollution and social issues, which will make Dunga, beach less attractive and will result in reduced number of tourists. Obviously, such decisions carry long and short-term consequences, and the two are often diametrically opposed, since they focus on identifying and removing the fundamental cause of the symptom problem. If a temporary, short-term solution were needed, developing a two-tier approach simultaneously would be useful. That is, while a short-term fix is applied, planning should be continuing to find a fundamental long-term solution.

The tragedy of the commons is another system archetype discernible from the Dunga tourism system model. Tragedy of the commons is what happens to common resources because of human greed (Van Vugt, 2009). The core intention of this term is to demonstrate a situation where a single player gains the benefits, while the consequences of actions are shared among a larger group of people (Chan and Huang, 2004). The root cause that creates this tragedy is typically economies of scale. Everyone wants to maximize returns from the common resources, and people will tend to take actions that in the long-term damages interests of the whole group (Seddighi, & Theocharous, 2002).

In Dunga beach and wetland, the tragedy of the commons archetype is happening in many beautiful places where most of the attractions for tourists on the beach are found, such as the wetland birds, hippo views and water tours. This beach receives hundreds of tourists everyday that require a large amount of services to accommodate their demands. Each tourism operator tries to consume more of the common resources on the beach to gain maximum returns. However, as there is insufficient space, these tourism sites are unable to accommodate the increase in demand for tourism. This makes it inconvenient for everyone and his or her income starts to fall. The environment will also start to further degrade due to increased pollution, and the negative effect on biodiversity

5.0 Conclusion and Recommendations

5.1 Conclusion

Ecotourism in Dunga beach and wetland represents a dynamic and complex system. The process of developing the tourism conceptual model has significantly helped the relevant stakeholders within the destination. The interaction among tourism stakeholders has created a better understanding of the dynamic and complex relationships in the system among these stakeholders. This was done through the participatory process of sharing and aligning divergent mental models of the different stakeholders. This process provided a platform for the stakeholders to engage in co-creation of experiences and activities in Dunga with aim of developing a sustainable tourist destination.

The systems model presents the scenario of tourism in Dunga beach and wetland that further illustrates how the factors affecting the system are not isolated and independent, but are dynamically linked. It shows how the different factors cause growth or decline in each other as well as in other key areas of the system. The model can therefore be used as a platform for dialogue, communication, collaboration and decision making between relevant stakeholders in the region. This makes the model potentially a powerful tool for policy makers and practitioners, tourists who have to manage, explore and sustain the tourism system as a whole.

Development of the causal loop model of the tourism system in Dunga beach and wetland has served as a solid foundation to enable the identification of key leverage points in the system. These leverage points are valuable in allowing the formulation effective and timely systemic intervention strategies to enable sustainable tourism destination development in Dunga beach.

5.2 Recommendations

1. The tragedy of the common archetype identified in Dunga tourism system can be addressed in many ways. While the tourism operators on the beach continue to think and behave as if there are limited connections between the systems they are operating in that will affect their ability to meet their respective goals and objectives, the problems will remain. Capacity building is needed to raise an awareness of the true picture of the whole system amongst all stakeholders on the beach who share common resources for their businesses.
2. The policies and regulations that will enable people to create a form of self-regulation to the use of the local tourism resources need to be introduced by the County government in consultation with the local stakeholders. This could only be achieved if an integrated master plan and operational strategy for tourism sectors are introduced.
3. Concerning the archetype of "Fixes that Fail" as identified in Dunga tourism system, developing a two-tier approach simultaneously would be useful. That is, while a short-term fix is applied, planning should be continuing to find a fundamental long-term solution.
4. The reinforcing process of growth through massive investments on tourism infrastructure and facilities roads, modern tour boats, and recreational facilities were identified as areas that have received a lot of attention, without recognizing the constraints, such as pollution, environmental degradation and carrying capacity. These constraints are a significant threat to the sustainability of tourism in Dunga that must be taken into consideration while designing for extra-ordinary tourism experiences in Dunga beach and wetland.

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