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**Tourism adaptation to climate
change in the lenses of sustainability:
*Sustainable-adaptation***

JOSEPH. M. NJOROGÉ

ABSTRACT

Climate change is considered one of the greatest challenges for humanity in the 21st century and beyond. Climate sensitive industries including tourism are vulnerable. In efforts to counter climate change, mitigation and adaptation are proposed. Mitigation is an important policy response to climate change however it may not address the immediate risks posed by climate change but adaptation is Urgent. In practice some tourism stakeholders are already engaging with either planned adaptation or autonomous adaptation. However, concerns have been raised on sustainability of adaptation options and approaches. Considering sustainable adaptation has received little interest in tourism research and the fact that tourism is considered behind in many aspects of climate change, this paper intends to fast forward this important theme in tourism climate research. I intend to discuss adaptation in the context of sustainability. Five issues that tourism may face while forging sustainable adaptation are highlighted including: Heterogeneous actors with differentiated interest; Competition for resources; Limited research on sustainable-adaptation; Awareness gap and Lack of commitment among tourism players.

Key words: Sustainability, Sustainable adaptation, Climate change, Tourism, Sustainable development

1. INTRODUCTION

Climate change is considered one of the greatest challenges for humanity

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in the 21st century and beyond. In efforts to counter climate change, mitigation and adaptation are proposed. Mitigation is an important policy response to climate change however it may not address the immediate risks posed by climate change hence adaptation is Urgent.

Adaptation has received attention both by policy makers and in academia. Different approaches *e.g.*, Top Down approach vs Bottom Up approaches have been popular in early adaptation policy research (Bhave *et al.*, 2014). The later has been more popular considering the need for local foci on regions, communities, cities, households (Amaru and Chhetri, 2013; Heltberg *et al.*, 2012; Horn and Simmons, 2002; Kaján, 2014; Picketts *et al.*, 2012).

In research adaptation in relation to certain phenomenon of interest that reflects our social-economic and environmental sustainability has been advanced. These themes include studies on climate change adaptation and sustainability (Stocker *et al.*, 2012), Adaptation and sustainable resource management (*e.g.*, Bisaro *et al.*, 2010; Delgado *et al.*, 2013; Ludwig *et al.*, 2014), Adaptation and intergeneration equity (Weiss, 1989, 2008; Yohe, 2007), adaptation and security (Owuvor *et al.*, 2011a), among other research front on adaptation. Some of these researches have reported concern on how adaptations in poor communities have led to environmental degradation hence compromising ecological sustainability and social injustice as a result of adaptation strategies (Eriksen and Brown, 2011; Eriksen *et al.*, 2011). Whilst other case studies suggests that adaptation at one level may produce mal-adaptation at another level (Eriksen *et al.*, 2011), It is clear that concerns on the resultant adaptation may promote or compromise sustainability of a system. In this view I intend to frame the new school of thought: 'sustainable-adaptation' in the context of tourism and as a solution for survival of sustainable tourism. This paper discusses adaptation in the context of sustainability. Sustainability models are reviewed including economic, social, environmental and integrated sustainability models. The basic principles of sustainability are outlined and integrated in adaptation theory. Key concepts for adaptation and sustainable-adaptation outlined. Hopefully these thought will challenge tourism-and-climate-change-nexus researchers to take up this theme which is already advancing in human-development-and-climate-change nexus. For a fact tourism is about 5 to 7 years behind in many aspects of climate change research (Wolfsegger *et al.*, 2008).

2. SUSTAINABILITY CONCEPT

2.1. Historical Overview

Sustainability theories try to integrate social, economic and environmental models in the context of human advancement at all levels of development.

Separately, the Economic models looks at sustaining financial capital while ecological model looks at sustaining biodiversity and ecological integrity whereas social models looks at advancing social justice and equity. Integrated sustainability model aims at creating an optimum balance between social, economic and ecological models. Since adaptation has been argued as an urgent measure in response to changing climate regime we therefore attempt to evaluate adaptation in the lenses of sustainability.

Literally, sustainability means ensuring continuity in the future. Oxford dictionary defines sustainability as the ability to maintain certain rate or level, ability to 'uphold' or 'defend'. In tourism sustainability means, literally, the ability of the form of development to ensure continuous desired growth. On global scale sustainability has come into focus due to changing conditions within social, economic and ecological systems. In order to put sustainability into context a historical account of the term sustainability is necessary.

Earlier concern about sustainability can be traced as far as 18th century when Thomas Malthus was concern with the question whether planet's limited resources can continue to support growth and development (Dixon and Fallon, 1989). This contradicts traditional economist view that is concern with the efficiency of resource use without questioning the limitation of resources (Khan, 1995). These earlier concerns resurfaced in early 1970's with the publication of *Limit to Growth*; a publication funded by Volkswagen foundation and commissioned by the Club of Rome. The authors used models to explicate economic growth and population under finite resources. The model provided 12 plausible growth scenarios between the years 1972-2100. It forecasted human economic growth which followed by a decline or a collapse and concluded that the growth would eventually come to an end.

For the first time the terms 'sustainable' was used in the context of development coined in a report: work *Our Common Future* popularly known as the Brundtland report. It defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). This definition has been criticised and acknowledged by equal measure. In a review of early literature on SD Lele (1991) concludes SD was dogged by that lack of consistency in interpretation of the concept, incomplete understanding of the link between poverty and environmental degradation and confusion about the role of economic growth, concept of sustainability and participation.

At policy level, concern over the environment and development were raised at the United Nations Conference on Environment and Development (UNCED) popularly known as the Rio Summit or the Earth Summit of 1992 held in Rio De janeiro, Brazil. The conference saw attendance by 116

head of governments and territories over 2,400 representatives of Non Governmental Organizations (NGOs) and 17,000 people in parallel forums in attendance. Four issues were tabled including: the need for scrutiny in production systems and processes to control production of toxins, alternative energy source to replace fossil fuel that is linked to climate change, need for promotion of public transport to combat city congestion and pollution and, exacerbating water scarcity. The Rio summit resulted in 3 crucial documents: Rio Declaration on Environment and Development, Agenda 21, Forest Principles and, 3 conventions including: Convention on Biodiversity, Framework Convention on Climate Change (UNFCCC), United Nations Convention to Combat Desertification. World leaders were called upon to rethink development in pursuit of sustainable development

Following The Rio conference the ground opened up for both research and policy makers. The Agenda 21, which basically outlines the guiding principles of sustainable development, became the blue print for development. The need to find a balance between Social sustainability, economic sustainability and environmental sustainability dominated forums, conferences and research fronts. Sustainability research themes emerged for example 'Sustainable agriculture', 'Sustainable tourism development', 'sustainable urban planning', 'sustainable natural resource management', 'sustainable forest management', etc. (see Box 1)

In order to understand the ideology behind sustainability, we need to examine the different models of sustainability (*i.e.* economic sustainability model, environmental sustainability model, social sustainability model and integrated sustainability model) in detail.

2.2. Concepts of Sustainability

In advancing sustainable development key elements of sustainability are viewed as important pillars for achieving sustainability. These pillars are social pillar, environmental pillar and economic pillar. In order to operationalise sustainable development arguments around these pillars need to be discussed.

2.2.1. Economic sustainability model

Economic sustainability is associated with the view that the objective of an economic system is to satisfy current need ([Basiago, 1998](#); [Khan, 1995](#)). In order to understand economic sustainability it has been argued that one must 'extrapolate the definition of Hicksian income from sole focus on human-made capital and its surrogate (money) now to embrace the other forms of capital (natural, social and human) ([Goodland, 1995](#)). It has been noted that earlier economists assumed that the supply of natural resources

were infinite and further placed optimism on the capacity of the market to allocate resources efficiently ([Basiago, 1998](#)). However, natural resources are limited thus raising concern among commentators on the feasibility of uncontrolled growth and exponential consumption ([Goodland, 1995](#)).

In this view new thoughts on economic sustainability have been linked to environmental sustainability such that economic sustainability is designed to be designed within the limits of the environment, *i.e.* must adhere to environmental sustainability ([Goodland, 1995](#)).

2.2.2. Environmental sustainability model

Environmental sustainability relates to ecological integrity, carrying capacity and protection of biodiversity. Environmental sustainability refers is the capacity of the biosphere to meet the needs of present generation without hindering the ability of future generations to fulfil their need from ecological resources. It draws from the thought that human can exploit ecological resources to fulfil present need and exhaust these resources hence incapacitating future generations. Therefore it is important for humans to use ecological resources efficiently.

Herman Daly (1991) who is among the early researchers in ecological sustainability explores ecological sustainability through a natural capital point of view. For example he argues that for renewable resources the rate of consumption should not exceed the rate at which the regeneration of these resources occurs. For pollution the rate of waste production should not exceed the capacity or ability to handle waste sustainably. And for the case of non renewable resources efforts should be made to provide substitute.

2.2.3. Social sustainability model

Earlier definitions of social sustainability had been associated with environmental sustainability ([Khan, 1995](#)). However in the Goodland review he challenged social scientists to provide their own definitions of social sustainability *i.e.*, looking at sustainability in the lenses of society and society progression. More fundamentally it is the examination of the nexus between poverty and environmental decay ([Ruttan, 1991](#)). Goodland argues that there is a stronger linkage between economic sustainability and environmental sustainability ([Goodland, 1995](#)). It was therefore important for social scientist and social related discipline to define social sustainability in sociological terms ([Khan, 1995](#)). This stand point of view has since been contested by social scientists in the sense that a social condition (poverty) would lead to exploitation environmental resources as argued by [Ruttan \(1991\)](#). It has also been argued that environmental degradation is expected

in the first stages of social-economic development in the short term (Basiago, 1998; Khan, 1995).

Other aspects of social sustainability are discussed under equity. Haughton (1999) outlines five equity principles:

- (i) Futurity –inter-generational equity;
- (ii) Social justice–intra-generational equity;
- (iii) Transfrontier responsibility –geographical equity;
- (iv) Procedural equity –people treated openly and fairly –and
- (v) Inter-species equity –importance of biodiversity.

2.2.4. Integrated sustainability model

Other thoughts have been advances on the need for integrating the three elements of sustainability. As Basiago, (1998) puts it:

If a man in a rural area lacks a job (economic), he is likely to be poor and disenfranchised (social). If he is poor and disenfranchised, he has an incentive to engage in practices that harm ecology, for example, by cutting down trees for firewood to cook his meals and warm his home (environmental). As his actions are aggregated with those of others in his region cutting down trees, deforestation will cause vital minerals to be lost from the soil (environmental). If vital minerals are lost from the soil, regional inhabitants will be deprived of the dietary nutrients required to sustain the intellectual performance needed to learn new technologies, for example, how to operate a computer, and this will cause productivity to stagnate (economic). If productivity stagnates (economic), poor people will remain poor (social), and so on. (Basiago, 1998:p150)

The above illustration is a clear indication of how the three elements or what is commonly referred to pillars of sustainability namely economic, social and environmental sustainability are somewhat interrelated. Whilst earlier sustainable development researchers have tried to illustrate how the three elements can be integrated, these illustrations have been a contested. Two models have been a point of contention among researchers with ‘weak’ and ‘strong’ sustainability (see Figs. 1 & 2). The contention between the ‘strong’ and ‘weak’ sustainability has emerged from the views around ‘natural capital’ in relation to ‘human-made capital’. Advocancers of ‘weak’ sustainability view maintain that natural capital can be substituted with ‘human-made capital’. This stand had been advanced by traditional economists who viewed technology as a substitute of natural capital hence amidst exponential growth and consumption of natural resources, extinction of resources would be replaced by technology (Human-Made capital). On the other hand the advocancers of ‘strong’ sustainability view ‘human-made capital’ as a complimentary to ‘natural capital’.

Venn model, also referred to as ‘weak sustainability’ sought to provide a simple representation of the three pillars (society, economy and environment). It assumes that by integrating the three pillars a central point of equilibrium is reached where sustainability thrives. This notion has been criticised and a new focus has been arguments towards strong sustainability as advanced by the ‘Russian doll model’; the strong sustainability model. Although the model acknowledges the dependence of the three elements (society, environmental and economic) the environment is viewed as the most important element of the trio. This is based on the argument that all the three pillars of sustainability cannot be merged to reach a status quo. Thus all economic activities must be done in a way that it advances social welfare and justice within the limits of the environment (O’Riordan, 1998).

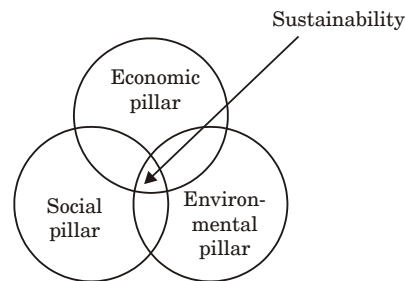


Fig. 1: Venn illustration of ‘weak’ sustainable development

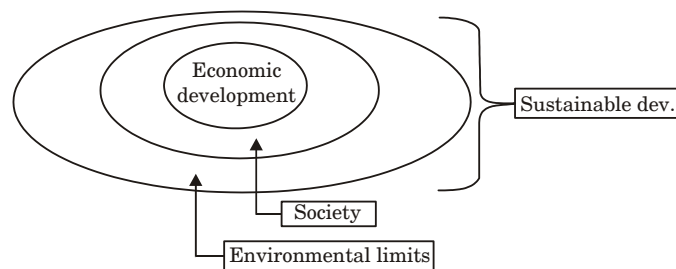


Fig. 2: Russian doll illustration of ‘strong’ sustainable development

The 18 principles of sustainability.

1. People are entitled to a healthy and productive life in harmony with nature.
2. Development today must not undermine the development and environment needs of present and future generations.
3. Nations have the sovereign right to exploit their own resources, but without causing environmental damage beyond their borders.
4. Nations shall develop international laws to provide compensation for damage that activities under their control cause to areas beyond their borders.

5. Nations shall use the precautionary approach to protect the environment. Where there are threats of serious or irreversible damage, scientific uncertainty shall not be used to postpone cost-effective measures to prevent environmental degradation.
6. In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process, and cannot be considered in isolation from it. Eradicating poverty and reducing disparities in living standards in different parts of the world are essential to achieve sustainable development and meet the needs of the majority of people.
7. Nations shall cooperate to conserve, protect and restore the health and integrity of the Earth's ecosystem. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.
8. Nations should reduce and eliminate unsustainable patterns of production and consumption, and promote appropriate demographic policies.
9. Environmental issues are best handled with the participation of all concerned citizens. Nations shall facilitate and encourage public awareness and participation by making environmental information widely available.
10. Nations shall enact effective environmental laws, and develop national law regarding liability for the victims of pollution and other environmental damage. Where they have authority, nations shall assess the environmental impact of proposed activities that are likely to have a significant adverse impact.
11. Nations should cooperate to promote an open international economic system that will lead to economic growth and sustainable development in all countries. Environmental policies should not be used as an unjustifiable means of restricting international trade.
12. The polluter should, in principle, bear the cost of pollution.
13. Nations shall warn one another of natural disasters or activities that may have harmful trans-boundary impacts.
14. Sustainable development requires better scientific understanding of the problems.
15. Nations should share knowledge and innovative technologies to achieve the goal of sustainability.
16. The full participation of women is essential to achieve sustainable development. The creativity, ideals and courage of youth and the knowledge of indigenous people are needed too. Nations should recognize and support the identity, culture and interests of indigenous people.
17. Warfare is inherently destructive of sustainable development, and Nations shall respect international laws protecting the environment in times of armed conflict, and shall cooperate in their further establishment.
18. Peace, development and environmental protection are interdependent and indivisible

Source: Adapted from "Introduction" in McKeown, Rosalyn. Education for Sustainable Development Toolkit, Version 2, Centre for Geography and Environmental Education, University of Tennessee, July 2002.

3. ADAPTATION THEORY

In response to climate change, 'mitigation' and 'adaptation' are considered the key strategies. These are important and complement measures (Parry, 2007b; Smit *et al.*, 1999; [Weaver, 2011](#)). However adaptation is considered

as an urgent measure to tackle the impacts of climate change (IPCC, 2007). This is because even if the GHGs emission remain constant global warming will prevail due to historical emissions hence its associated risks will linger (Parry, 2007).

The beginning for theoritizing adaptation is the understanding of What, Who, Why, How, Where and When questions (Hutcheon, 2006). This can be noted in the most authoritative definition of adaptation by IPCC.

Adaptation is defined as:

‘Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation’ (IPCC TAR, 2001).

Thus adaptation to climate change may be derived as adjustment (what?) in natural or human systems (who) in response to actual or expected climatic stimuli or their effects, which moderates or harm or exploits beneficial opportunities (why?). The different types of adaptation, including anticipatory and reactive adaptation (How, When and where), private and public adaptation (Who), and autonomous and planned adaptation, (When).

3.1. Types of Adaptations

As noted above the three distinguished categorization of adaptation:

a) Based on timing

- *Anticipatory adaptation:* These are adjustments that are made before the impact is experienced. This is informed by the availability of prior information or convinced perceptions that climate change impacts would be anticipated.
- *Reactive adaptation:* This is a non-planned form of adaptation which is undertaken when the climatic impact is observed or felt.

b) Agency

- *Private adaptation:* This is the form of adaptation that is initiated by individuals, households, private companies or a society without government involvement.
- *Public adaptation:* This is the form of adaptation undertaken by government. They are usually vested in programmes and projects that are aimed to climate proof a system of concern.

c) Awareness/ Intent/ purposefulness

- *Autonomous adaptation:* This is a non conscious adjustment. The

response to the stimuli is triggered by the changes in the system (ecological, economic and human system) hence adjustment must be done to maintain the status quo or to take advantage of the presented opportunities.

- *Planned adaptation*: It is the form of adaptation that is undertaken based on conscious awareness of anticipated stimuli and or its effects.

Many commentators in adaptation research have associated autonomous adaptation with individuals, households and private entities whereas planned adaptation has been associated with government policies and projects for climate proofing (IPCC, 2001). In this sense it can be underscored that agents undertaking autonomous adaptation are more or less reactive to a stimuli. Another observation is that those undertaking planned adaptation anticipate with some degree of confidence that there is need for preparing for the future to put in check vulnerability of a system (Parry, 2007c; Smith, 1996). Considering this link it has been argued that any form of type of adaptation can complement one another. [Fankhauser et al. \(1999\)](#) discusses the link as a move for an individual to adjust to a stimuli (private) and a government developing programmes and projects to facilitate the individual or household to adjust in aggregate results to better adaptation.

3.2. Vulnerability and Adaptive Capacity

In order to understand adaptation options and its associated costs it is important to evaluate impacts and vulnerability of a system, sector or region ([Fankhauser, 2010](#); [Fankhauser et al., 1997](#)). Impact in this regard to a 'stimuli' that destabilise the normality of any system's condition whereas vulnerability of a system, region or a community will depend on the ability to adapt which is highly associated with exposure and the adaptive capacity.

Adaptive capacity is defined as:

The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. (IPCC TAR, 2001 a)

The determinants of adaptive capacity are relative to economic, social, institutional and technological conditions which may be enhanced or constrained by facilitation of adaptive measures ([Adger, 2000](#); [Bohle et al., 1994](#); [Bulkeley and Tuts, 2013](#); [Cutter, 1996](#)). It is noted that in order for individual to adapt more efficiently and effectively incentives, knowledge and skills are required ([Fankhauser et al., 1999](#)). In this case role of governments has been underscored by many commentators in adaptation

for facilitating these elements and their role span from facilitation of enabling environment to planning and implementing adaptation. Aaheim and Aasen (2008) taking an economic view of adaptation discusses the role of the government as important in addressing market failures.

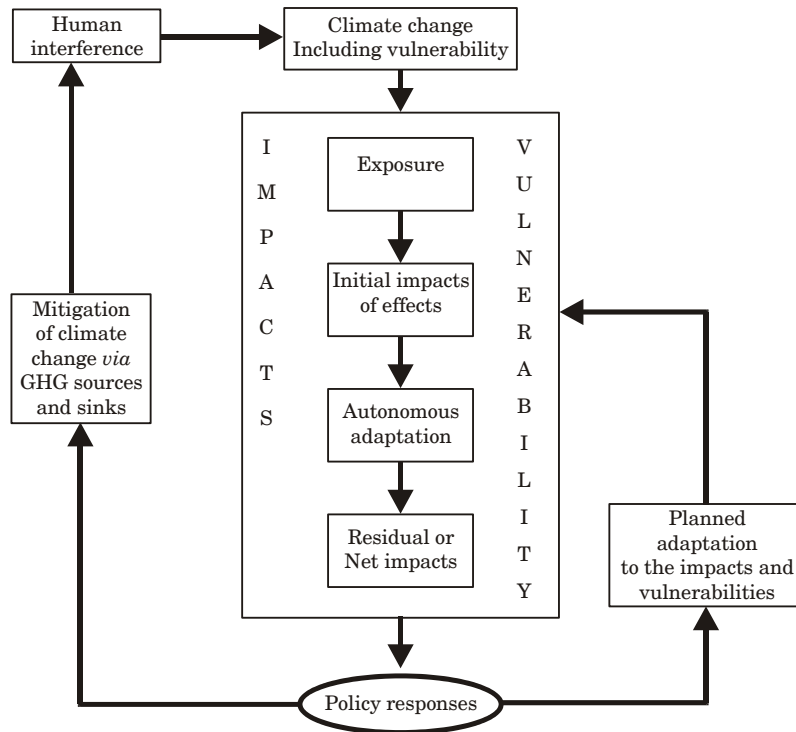


Fig. 3: Adaptation in IPCC assessment (Smit *et al.*, 1999)

3.3. Sustainable Development, Sustainable Tourism and Sustainable Adaptation

Serious questions have been asked before but what has caught my attention in tourism research is one posed by [Weaver \(2011\)](#); *Can sustainable tourism survive climate change?*

This paper is partly a rejoinder to the question and partly a reply from convinced thoughts. As a rejoinder the survival of sustainable tourism is a question of concern considering the role of sustainable tourism is social-economic development and environmental/biodiversity promotion. As a reply to this question i am strongly convinced that the answer lies on sustainability concepts and the need for urgent adaptation. By borrowing from the concepts of sustainability and the theory of adaptation, sustainable-

adaptation may come in handy. But before we trend that line lets revisit the concept of sustainable tourism development to highlight the meaning, objectives and sustainable tourism thus far, in brief.

3.1.1. Sustainable tourism development

In the post industrial period tourism has been promoted as an important social economic sector. Coupled with better and efficient means of transport, increased disposable income, relative global peace, improvement of infrastructure and better means of communication tourism has expanded. An exponential growth has been observed from a 25 million global international arrivals to currently over one billion international arrivals posted in 2012 and the trend is expected to grow at about 4% annually until 2030 (United Nations World Tourism Organization, 2013). This rapid growth has had both positive and negative impacts. The positive impacts are associated with means of employment, growth in GDP, improvement of balance of payment among developing countries, agent for globalisation among other local, national and global benefits ([Akama, 1999](#); [Akama and Kieti, 2007](#); [Saarinen and Rogerson, 2013](#); [Sindiga, 1999b](#); [Strickland-Munro et al., 2010](#)). However on contrary tourism has been associated with environmental degradation associated with CO₂ emissions and environmental degradation of the destination. Other negative impacts include commercialization of culture ([Akama and Sterry, 2002](#)); community marginalisation, and huge economic disparities associated with tourism ([Scheyvens, 2011](#)).

In order to encourage meaningful growth and the need to eliminate the 'evil' in tourism, new development path ways, new decisions and alternative ways had to be considered. This is in line with the Budtland report that calls for new thinking of sustainable growth. As the concept of sustainability became popular, although still a contested concept, tourism researchers attempted to interpret sustainability within tourism development. Early thoughts and contention include two extremes; the 'tourism-centric', to include the ones advancing the economic sustainability of tourism ([Hunter, 1995](#)) and those who view sustainable tourism development as a means move to better lively hood for the society and protection of environmental integrity ([Cronin, 1990](#)). Despite these contested views sustainability has been largely accepted concept in research and practice within the tourism sector (*e.g.*, [Gössling, 2000](#); [Irandu, 2006](#); [Liu, 2003](#); [Sharpley, 2000](#); [Sindiga, 1999c](#)).

A harmonised definition by the World Tourism Organisation defines sustainable tourism development as:

Tourism which meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future (World Tourism Organization 1993:7)

Therefore, sustainable tourism development aims at promoting the nexus between societal wellbeing, economic prosperity and environmental integrity protection (Akama and Kieti, 2007; Gössling, 2000; Irandu, 2006; Jiang, 2009; Liu, 2003).

Since tourism is already considered as a strategic sector in achieving Millenium Development Goals (MDGs) there is the need to rethink tourism development (Saarinen and Rogerson, 2013) especially now as the industry is already facing serious consequences of climate change (IPCC 2007; 2012). It is acknowledged that In the face of climate change tourism is under threat (Parry, 2007b; UNWTO-UNDP-UNEP, op. 2008) and so is it sustainability of the industry. It is therefore important for tourism stakeholders to urgently adapt (UNWTO-UNDP-UNEP, op. 2008). However not every adaptation is sustainable (Eriksen *et al.*, 2011).

Whilst tourism stakeholders will be advancing policies and actions to combat the effects of climate change it may be concluded there is a clear concern for future decisions in adaptation. It is in this context that I wish to put forward the arguments why sustainable adaptation is important for the survival of the sustainable tourism.

3.1.2 Sustainable adaptation

Sustainable adaptation is an emerging concept. Despite being hardly discussed in tourism it has been advanced in human- development and climate change studies. So what is sustainable adaptation? Sustainable adaptation lacks an agreed definition (Njoroge, 2014). However there are attempts to define the term in literature. The word sustainable has been discussed in the context of development under the famous report dubbed '*our common future*' and has been defined to mean assured continuity (World Commission on Environment and Development (WCED), 1987) on the other hand adaptation means reducing vulnerability.

Earlier attempts to define sustainable adaptation includes the work of O'brien and Leichenko (2008) notes like the name suggests, it has been coined from two words; 'sustainable' and 'adaptation' to include strategies that are aimed at 'reducing vulnerability' and to 'enhance long-term resilience'. In other definitions it is noted that sustainable adaptation is informed by the nexus between climate change and poverty reduction (Njoroge, 2014). In a project funded by the Norwegian Agency for Development and Corporation (Norad), (Eriksen and Brown, 2011; Eriksen *et al.*, 2011) analyses the linkage between vulnerability and poverty. This linkage is summarised as follows:

1. Any added risk by climate change to current ways of securing well-being,

2. The particular strategies or adaptive capacity of poor people in the face of climate stresses and,
3. The causes of vulnerability, or specific factors and conditions that make poor people vulnerable to climate stress.

In order to address the vulnerability as a result of poverty, the following measures are considered:

- (a) Reducing the risk on wellbeing of the poor,
- (b) Enhancing adaptive capacity and,
- (c) Addressing the root cause of vulnerability, (Eriksen and Brown, 2011 p. 342).

Similar suggestions are evident in other approaches aimed at reducing climate change vulnerability including 'pro-poor climate change adaptation' (Tanner and Mitchell, 2008) and 'community based adaptation' ([Heltberg et al., 2012](#)). All these approaches aim at reducing vulnerability among the poor and enhancing their means of securing livelihood in the long-run ([Njoroge, 2014](#)).

In a study of Central Vietnam revealed that interventions that were aimed at reducing vulnerability and increasing resilience on one community led to increased vulnerability of another community ([Beckman, 2011](#)). In another study by ([Owuor et al., 2011a](#)) it was revealed that formal policies and informal governance hindered the ability to adapt to drought among pastoralist hence fuelling conflict with farmers because the pastoralist were not allowed to graze their livestock in gazetted forest areas which acted as a buffer zone during drought seasons. Although there are limited studies on sustainable adaptation, there are some cases that have demonstrated the need to consider beyond 'business-as-usual' adaptation. Thus Sustainable adaptation is defines as:

Approaches that reduce destination's vulnerability and increase resilience without jeopardizing its economic viability, social justice and environmental integrity ([Njoroge, 2014](#))

3.1.3. *Enabling environment for sustainable adaptation*

As noted in the previous section the enabling environment for adaptation is highly influenced by the adaptive capacity including economic, social, institutional and technological conditions which may be enhanced or constrained ([Adger, 2000](#); [Bohle, Downing and Watts, 1994](#); [Bulkeley and Tuts, 2013](#); [Cutter, 1996](#)). In the case of sustainable adaptation is not different since these elements still influence the ability to adapt. However in addition to these element there is a need to consider the following.

- a) Adaptation as a collective action and must be inclusive. It has been

noted that the adaptation process involves a number of actors with differentiated interests which will eventually shape the outcome of the adaptation (Eriksen *et al.*, 2011; [Njoroge, 2014](#))

- b) Adaptation at all levels must develop a system for information exchange. Considering that adaptation at one level may lead to a mal-adaptation at another level, it is important that all levels have a system for information flow (Njoroge, 2014).
- c) Local knowledge should be encouraged. Human and ecological systems have been adapting since time immemorial (Hutcheon, 2006). Over a period of time the society generate a vast local knowledge on adaptation. This knowledge can come in handy when planning for adaptation considering that they may be efficient and cost effective.
- d) Need for feedback processes. Adaptation process must be checked hence there is a need for back and forth feedback processes. It should also be thorough in order to identify any form of mal-adaptation as soon as early signs are presented.

4. DISCUSSION AND CONCLUSIONS

Climate change is posing a major challenge to tourism viability (Parry, 2007b; UNWTO-UNDP-UNEP, op. 2008). In order to respond to climate change adaptation and mitigation are considered (Scott *et al.*, 2012; [Weaver, 2011](#)), however adaptation is urgent (IPCC 2007) and tourism must not neglect climate change ([Scott, 2011](#)). Currently, climate change policies are advancing at different levels of governance, at least rhetorically. Whilst this is good news for the sector, it is important to re-think adaptation. It has been argued, within tourism research by ([Weaver, 2011](#)) that tourism adaptation has been forged with business-as-usual approaches. In this regard adaptation has been viewed as a means to reduce vulnerability of the tourism sector with the focus of the economic viability of tourism businesses. However it should be noted that tourism has for over two decades advanced the concept of sustainable tourism as the alternative or good for of tourism and specific cases have shown viability of sustainable tourism (*e.g.* ([Lambert et al., 2010; \[Masau and Prideaux, 2003\]\(#\); \[Pineda and Brebbia, ©2012\]\(#\); \[Sharpley, 2000\]\(#\); \[Sindiga, 1999a\]\(#\)\)\). It is therefore prudent to argue that actions that are aimed at reducing vulnerability of the sector must be sustainable including adaptation.](#)

It is therefore for tourism stakeholders and more specifically researchers to forge this theme both in policy and research. Remember it has been noted that tourism is between 5 and 7 years behind in all aspects regarding climate change ([Wolfsegger et al., 2008\). As this theme comes into picture in tourism research i would wish to highlight five critical issues that may face sustainable-adaptation pursuit in the tourism industry.](#)

4.1. Critical Issue 1: Heterogeneous Actors with Differentiated Interest

The tourism sector has heterogeneous players at all levels from local to global and from the origin region, transits region and to destination. As adaptation will be expected to be undertaken at the local level it is prudent to focus on the destination part. At the destination there are many players including those who are directly associated with the tourism sector especially the suppliers of tourism services, the tourists, the regulator, Non-governmental organizations with interest in tourism resources, marketers, local community and others who are not directly associated with tourism but those who are key in facilitation of tourism services *e.g.*, banks, insurance, etc. For sustainable adaptation to be achieved, the principles of sustainable adaptation suggest that there is a need for wide consultation and inclusiveness in the decision making process. This can be a very challenging task however very crucial for sustainability of the adaptation options. Whatever options for adaptation that may be identified it should suit all interested groups. For example, investors would be keen on the cost of the adaptation option and how they would be affected as operator. On the other hand the question on how the options would affect the community will also be of interest among the local community especially on whether the option promote or doesn't promote justice for them for example of the need to relocate the local community to create room for the hotel business owners to retreat from sea front that is faced with risk of sea level rise. It is therefore expected that there is a need for actors to forge means for engagement.

4.2. Critical Issue 2: Competition for Resources

Tourism highly depends on natural resources. However these resources are not exclusive to tourism. Ecological services are also important for the local communities as it is to tourism. Biodiversity is under threat in the face of climate change. Most destinations in the south especially those local communities depend on ecological services would face dire consequences as the resources are depleted. It has been established that climate change has become a security issue and a source for conflict for example in the agriculture and pastoral communities (Ouor *et al.*, 2011; Scheffran *et al.*, 2014; Vivekananda *et al.*, 2014). Could tourism face security challenges for example among beach operators and beach hotels, fishermen and boat tourism-operators, or hotels in game reserves and pastoral communities or the case of human-wildlife conflict? At this juncture it is a wait-and-see situation but it would be a topic of interest in tourism research as well.

4.3. Critical Issue 3: Limited Research on Sustainable-Adaptation

Sustainable adaptation is quite a new area in research, it is emerging.

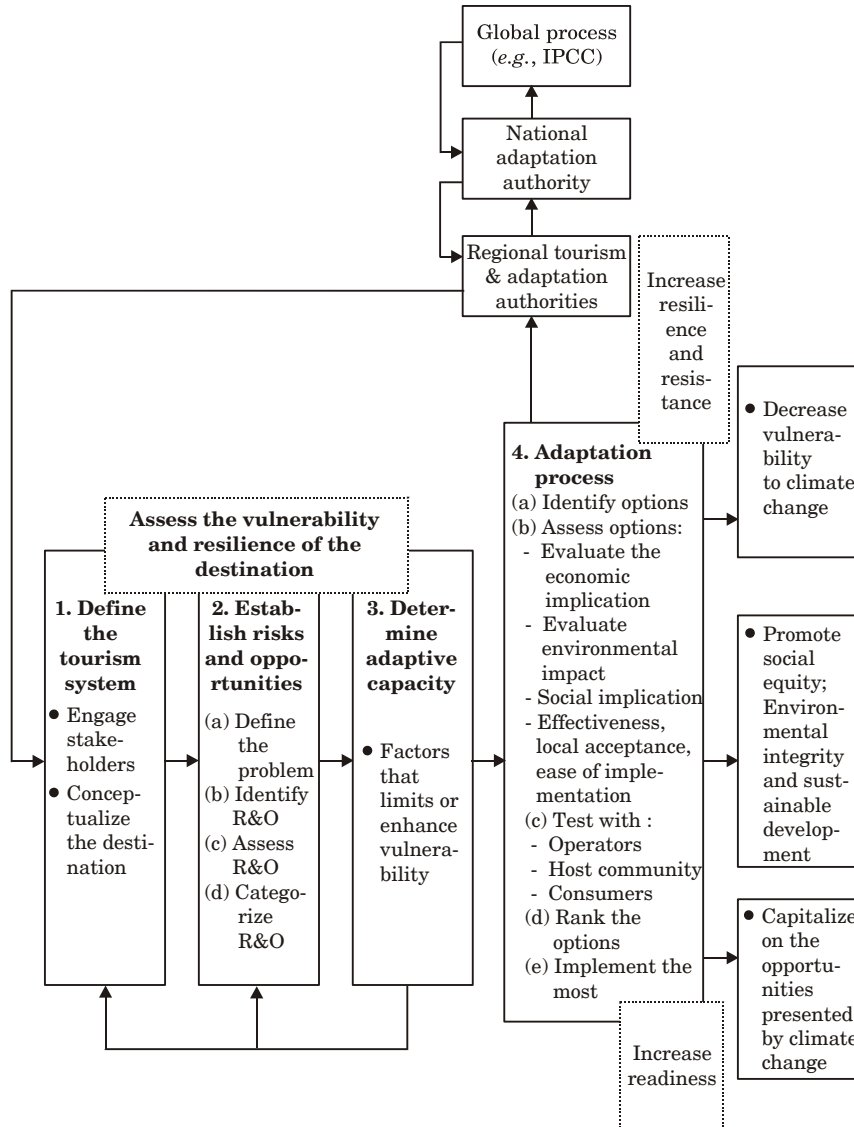


Fig. 4: An enhanced Regional Tourism Sustainable adaptation Framework (RTSAF) (Njoroge, 2014: p29)

Whilst tourism is said to be behind about 5 to 7 years in all aspects of climate change research, sustainable-adaptation research in tourism might not get immediate attention. However, there are indications that some researchers are pursuing. For example Csete and Szecsin (2012) studied on vulnerability of central Hungarian region and in turn developed a

Tourism Sustainable Adaptation portfolio. Such a portfolio may be used by tourism stakeholders and policy makers in mainstreaming adaptation. In another study by Kaján (2014) who studied community-based-adaptation in Northern Finland. The study revealed that current adaptation strategies do not fully support the idea for sustainable adaptation. Njoroge (2014) on the other hand after reviewing current tourism specific regional adaptation frameworks and models criticised the existing frameworks for failing to consider sustainable adaptation principles. He further proposed an enhanced Regional Tourism Sustainable adaptation Framework (RTSAF) (see Fig. 3 below) (Njoroge, 2014). While knowledge gaps exist on sustainable adaptation case studies research in this area could provide better insight. Therefore it is worth noting that there is a need for tourism researchers to consider this theme and provide case studies to advance knowledge and best practice examples.

4.4. CRITICAL ISSUE 4: AWARENESS GAP AND LACK OF COMMITMENT AMONG TOURISM PLAYERS

Tourism at global climate policy have done to a great extend good work in gathering information on climate change nexus. This can be traced back in 2003 when the first ever climate change and tourism conference was held in Djerba, Tunisia (9th to 11th April 2003). This conference brought together 140 delegates from 45 countries including tourism authorities, organization, businesses and scientists to exchange views on the consequences, opportunities and risks presented to the tourism sector due to climate change. The meeting concluded on a few resolutions among them the need to urge government to subscribe to intergovernmental and multilateral agreements, need for researchers to advance knowledge on tourism and climate research. One of the themes that tourism researchers have focused on is climate change awareness and perception of tourism stakeholders.

In a study by Trawöger, (2014) who examined stakeholders perceptions of climate change associated risks reports that coping with climate change is not a priority for risk management. In another study by (Belle and Brammwell, 2005) notes that despite an increased awareness of climate change impacts and vulnerability of Barbados among tourism stakeholders, tourism managers inclined about policy interventions. Marshall *et al.*, (2011) in a study of awareness of early impacts of among tourism operators' reports that majority of the tourism operators were not aware of any signs of climate change impacts. Rayamajhi, (2013) on the other hand studied Perceptions of Stakeholders along the Annapurna Trekking Trail reports that there is a remarkable level of awareness of environmental changes and climate change but the stakeholders did not see any impacts that would threaten their businesses. Such perceptions may be a contributing factor to lack of commitment to actions in response to climate change impacts.

4.5. Inherent Criticism of Sustainability Concept

Like earlier mentioned, the term sustainability has been highly contested. The contest can be mapped between commentators who view it as they lack resolution and problematic as observed by [Brandon and Lombardi, \(2011\)](#), [Connelly, \(2007\)](#). It has also been considered as a 'hard to achieve' ([Agyeman and Tuxworth, 1996](#)). However these contested views have been softened over time in the past two decades despite lack of clear operationalization of the concept. Despite these views which have emanated from other disciplines other than tourism, tourism sustainable development is a living testimony that development can be advanced to improve economic conditions of a society within the limits of environmental sustainability ([Gössling, 2000](#); [Irandu, 2006](#); [Jiang, 2009](#); [Sindiga, 1999a](#); [Tsaur and Wang, 2007](#)). While new concept of 'sustainable adaptation is emerging' and may find relevance in tourism adaptation responses, the concept may be expected to be dogmatized. Therefore there is a need for future researchers to engage in constructive contest as we advance this theme in tourism research.

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