



Sustainable Protection and Preservation of Heritage Sites Attractions from Climate Change in South Africa

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Abstract

South Africa has numerous natural tourism heritage sites spread across the entire landscape of the country that attract tourists from across the globe. However, the concern is that these sites are vulnerable to various threats such as the impact and effect of global climate changes, mining pollution and other hazardous human activities which may lead to their degradation and subsequently lower their tourism value and importance. Furthermore, these threats, especially climate change will lead to loss of preservation of the unique history of South Africa. This article examines potent interventions that have been introduced to curb these threats to heritage sites. Pursuant to this, the article focuses on interventions that seek to preserve and conserve heritage sites for sustainable tourism for purposes of sustainable tourism enterprises, dire poverty alleviation and sustainable jobs, enhanced development and improved economic growth.

Keywords: Bizarre weather events, bequeathed sites, global warming, conservation, sustainability

Introduction

The UNESCO World Heritage Sites were created in 1978 by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to be responsible for declaring a site as World Heritage Site and subsequently included in the list of the World Heritage Sites (WHSs) after meeting certain requirements (Isar, 2000). UNESCO is a “specialized agency of the United Nations system that promotes collaboration among its member countries in the fields of education, natural sciences, social and human sciences, culture, and communications and information” (Blanchfield & Browne, 2013). Against the backdrop of this significant role, UNESCO has continuously been designating important sites around the globe as part of an effort to preserve the world's cultural and natural heritage sites (Ryan & Silvano, 2009). World Heritage sites are remarkable landmark or area which are specifically selected by the UNESCO as having cultural, historical, scientific or other form of acclaimed significance and they are all legally protected by international treaties (Kurin, 2004). More importantly, these heritage sites are adjudged as being very important to the collective interests of humanity (Maarleveld et al., 2013).

Methodology

In this article, non-empirical literature review approach was utilised by reviewing, analysing and examining critical legislation and policy interventions that have been strategically put in place to ensure and guarantee the protection of the world heritage sites considering that these sites are vulnerable to the impact of climate change. Against this backdrop, contemporary scholarly works both books and articles, pieces of legislation, the Constitution of the Republic of South Africa, 1996 were thoroughly consulted, reviewed and utilised for the purposes of finding sustainable solutions to carbon dioxide emissions causing global climate change. This is done against the backdrop that most of these world heritage sites are vulnerable to climate change and for them to be protected and preserved for the present and future generations, pragmatic approach where responsible and sensible steps are taken to drastically reduce and thereafter totally eradicate carbon emissions causing climate change will be an impetus for sustainability of the world heritage sites in South Africa. Also, the opportunities presented by



the world heritage sites tourism's were also emphasised particularly the promotion of entrepreneur activities around the areas where they are located. The benefits to the poor and the indigents including businesses are crucially imperatives for poverty alleviation, economic growth, clean environment and sustainable protection and preservation of heritage sites. Therefore, the article accentuates that preserving these sites in their natural and original forms will continue to attract tourists.

Literature Review

UNESCO recognised two types of World Heritage Sites namely the cultural heritage sites and natural heritage sites (Rossler, 2006). For a site to be declared a cultural heritage site, it has to show a masterpiece of human creativity or an important exchange of human values over a long period of time sometime million years back (Pendlebury et al., 2009). Usually, these sites are seen and depicted in terms of their architecture or technology, the way and manner of the planning of the town or city and the design of the landscape (Turner, 2014). To be so declared, the site must depict convincing evidence of a tradition or civilisation that has disappeared or is still alive. The sites could also be types of buildings, group of buildings, use of technology or reflect important stages in human history.

More importantly, where humans settled and use the land for their cultural beliefs can also be a cultural heritage site. The uniqueness of these sites is that the landscape and the settlement are irreversible (Aplin, 2007). They are permanent archaeological sites. For these sites to continue to be recognised as heritage sites, the way and manner they are being managed and protected are also important as they confirm the authenticity of the sites (Timothy & Nyaupane, 2009). However, for a place to be declared as a world heritage natural site, it must show convincing major stages in the earth's history which developed over a period of protracted years (Di Giovine, 2008). Typical examples are fossils, rocks and the way nature has influence the land to form natural features like mountains (Eldredge, 2014). Due to these natural features, these places need to be protected and in most cases they fall within the ambit of protected sites and heritage sites. To this end, an area that contains rare natural formations, like unique rock shapes, or is very beautiful, or has habitats and species of animals and plants that can only exist there are eligible for protection as unique natural site (Newsome et al., 2012). More importantly, managing, protecting and looking after these sites whether cultural or natural sites are the main sources of their sustainability (Newsome et al., 2012).

Against the backdrop of the significant of these sites as presented above, it is therefore imperative to protect and preserve them for present and future generations. Any activity that will undermine their continuous existence or total degradation and destruction should be contained and curbed (Warner et al., 2010).

Undoubtedly, climate change is impacting on virtually every aspects of living and non-living things in the environment and the earth (Dryzek, 2013). Heritage sites are cultural and natural sites that form part of the environment and as such they are also vulnerable to climate change (Tompkins & Adger, 2004). The concern is that heritage sites are being negatively impacted at a disturbing rate majorly as a result of bizarre weather events. Therefore, there is the need for immediate concerted efforts to intervene and stop the negative impacts and effects of climate changes (Perry & Falzon, 2014). To this end, all available tools should be deployed in order to protect, preserve and conserve these heritages sites (Giaretta, 2011). The use of the laws to enforce combating of climate change is critically imperative if we want to preserve our heritage sites for tourism attractions and the history of the nation (Newsome, et al., 2012). As such, South Africa has put in place several pieces of legislation amongst other things in order to preserve and conserve these sites (Hallegatte, 2009).

This article notes that even though South Africa does not have obligations under international laws to reduce its carbon footprints because South Africa falls within the ambit of developing nations that have the laxity to continue to emit carbon dioxide, it is apposite to point out that



South Africa has taken steps to deal with issues such as carbon emission surrounding climate change through policies, strategies and legislation (Peterson & Cumming, 2003). By so doing, South Africa is showing its commitment to tackling and combating climate change by ensuring significant emissions reduction in all aspects of the country's activities (Dimitrov, 2010). For instance, in 2004, South Africa enacted the National Climate Change Response Strategy with the purpose of reducing carbon footprints as the first intervention in fighting climate change.

In 2008, the Vision, Strategic Direction and Framework for Climate Policy was introduced aimed at setting a framework for a long-term net zero-carbon electricity sector. The Framework also established general guidelines to curb the growth of greenhouse gas emissions by 2025 at the latest (Nachmany et al., 2014). Also, the National Climate Change Response White Paper was introduced to "outline a risk-based process to identify and priorities adaptation strategies and interventions that have to be taken in the short and medium term, to be reviewed every five years for the following areas: Water; Biodiversity and Ecosystems; Rural and Coastal Settlements; and Disaster Risk Reduction and Management" (Nachmany et al., 2014). These emissions reduction climate policies were introduced because South Africa is one of the highest emitters of carbon dioxide causing global climate change worldwide and the highest in Africa (Collier et al., 2008). Eskom-South Africa's firing coal in its coal fire power stations to generate electricity is one of the carbon emission sectors of the country's human and industrial activities.

More importantly, South Africa heavily relies on tourism for jobs and employments such as World Heritage Sites. Heritage sites are internationally recognised and they are tourists' destinations as many tourists visit these sites on an annual basis. Considering that there is high rate of unemployment and poverty is pervasive, these tourists' sites are sources of employments, jobs, livelihood and enterprises to majority of the people who live and work around and along these sites. If these sites are degraded or destroyed as a result of the impact of climate change, this will have negative effects on those people who rely on them for income and livelihood. Therefore, the key objective of this article is to highlight the importance of the preservation of heritages sites which are currently being threatened by various bizarre weather events that include climate change. Against this backdrop, the Constitution of the Republic of South Africa, 1996 guarantees the protection of the environment in which the heritages sites also reside (Kotze & Van Rensburg, 2003). For example, Section 24(a) provides that no harm should be inflicted on the environment; 24(b) that the environment should be protected for the benefit of present and future generations; 24(ii) to promote conservation and 24(iii) to ensure sustainable use of natural resources for development. All these provisions speak to ensuring that regardless the environment should not suffer degradation and destruction. Undeniably the release of greenhouse gas causing climate change by human activities is a violation of the Constitution because the Constitution guarantees the right to clean environment (Boyd, 2011). It should be pointed out that the right to protect the environment espoused in section 24 of the constitution is a fundamental rights contained in the Bill of Rights in the Constitution. The implication of this is that the right is inalienable and they must be protected, fulfilled and enjoyed. The government has the duty and responsibility to enforce this right whenever it is threatened. Global climate change is threatening these rights and as such, appropriate provisions contained in the laws should be used to confront and curb the threats.

Discharging its constitutional obligation to protect both living and non-living things living in the environment and the planet earth, South Africa has, subject to its Constitution, enacted two pieces of legislation for the purposes of protecting and conserving heritage sites namely:

- National Heritage Resources Act, 25 of 1999, the purposes of this law is to "introduce an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations; to lay down general principles for governing heritage resources



management throughout the Republic.” The aim was to “promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations”.

- National Environmental Management Protected Areas Act, 57 of 2003 (NEMPAA) whose purposes are to “provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith”.

World heritage sites in South Africa

Protected heritage areas and tourism are intricately linked because most of the protected sites contain and harbour magnificent monuments of different varieties such as mountains, wetlands, cradles, fossils, iconic landscapes, wildlife, land, sea, sands, estuaries, botanical landscapes, domes, parks and so on (McIntosh, 2008). Tourism has always been the major reason for the establishment and management of protected areas all over the world and South Africa is not an exemption (Watson et al., 2014). Most of the heritage sites in South Africa have enjoyed tremendous support from the government, private enterprise, Non-Governmental Organisations NGOS and UNESCO, in terms of protection, management and conservation (Wynberg, 2002). Heritage sites are contributing immensely to the economic growth and development of the country therefore intervention to protect them are critically imperative in order to guarantee sustainability (Eagles, 2002).

South Africa is naturally and historically endowed with heritage sites such as the Fossil Hominid Sites of South Africa, also known as 'Cradle of Humankind' have been declared by the UNESCO's World Heritage Committee as the world's official heritage sites (WHS, 1997). This declaration is significant because these sites are internationally recognised and as such are prominent tourist attractions for people of diverse culture, beliefs, ages and so on for various reasons. (Di Giovine, 2008) All heritages sites are vulnerable to the impact and effect of climate change and as such, all interventions to sustain them are imperative and must be implemented so that they continue to be protected, conserved and preserved for present and future tourisms and other activities (Eagles et al., 2002). Declared WHSs in in South Africa are:

the Cradle of Humankind is located in Gauteng is located and stretched 45 kilometre West of Johannesburg, South Africa and it is considered as one of Africa’s great cities on the continent in South Africa. It spreads across the region of Sterkfontein, Swartkrans and Kromdraai. The site has one of the world's richest concentrations of hominid fossils which are evidence of human evolution over the last 3.5million years ago. (Durand et al., 2010). It has many caves and “dig sites at 13 separate locations within an undulating landscape of low hills along a dolomitic limestone ridge.” However, it is pertinent to point out that while there are threats of negative impact of climate change on heritage sites, another threat that is notable in South Africa is the impact of mine pollution on most of these significant and richest archaeological and palaeontological resources. For instance, “the Cradle of Humankind World Heritage (COHWHS) is situated adjacent to one of the richest gold bearing geological sequence in the world. The mine pollution which is emanating from the mines in the form of acid mine drainage (AMD) is threatening this remarkable resource which has yielded the biggest collection of hominin fossils in the world” (Durand et al., 2010). Undoubtedly, this pollution is degrading the environment and the sites and as such it is a threat to tourism, hospitality, research and education. Sustaining these sites therefore require effective and efficient monitoring,



mitigation and management in order to avoid or minimise the negative effects which may cause the sites to be relegated by demoting it to the UNESCO List of World Heritage in Danger (Durand et al., 2010). Therefore, there is need to curb acid mines pollution in order to prevent most the ecological sites from losing their characteristics that determined their inscription in the World Heritage List. Otherwise, the World Heritage Committee may decide to delete the property from its list (Durand et al., 2010). To this end, South Africa may lose these income and employment generating tourism sites. The ripple effect will be very devastating because currently, many people rely on the activities around these sites for employment, income, enterprises and livelihood in different ways and dimensions.

The Mapungubwe Cultural Landscape also known as Mapungubwe-place of the stone of wisdom is located in Limpopo province (Fleminger, 2008). It was South Africa's first kingdom, and developed into the subcontinent's largest realm, lasting for 400 years before it was abandoned in the 14th century. Those who lived in this kingdom were highly sophisticated people and they were traders who traded in gold, ivory, and other merchandise with people from Asian countries such as China and India and African countries like Egypt.

Richtersveld Cultural and Botanical Landscape is located in the Northern Cape of South Africa. The landscapes spread across about 160 000 hectares of dramatic mountainous desert in the North-West part of South Africa. This heritage site is very beneficial to the community where it is located as they own and manage the entire landscape for different tourism activities (WHSS, 1997).

Robben Island is located in the Western Cape of South Africa. Nelson Mandela was imprisoned on this island for 18 years before he was moved to another jail where he spent another 9 years making up a total 27 years of imprisonment. Consequently, it is the most famous place in South Africa. The island is celebrated worldwide as a symbol of the victory and triumph of democracy and freedom over suppression and oppression as manifested in the apartheid era.

The Khomani Cultural Landscape is located at the border of South Africa with Botswana and Namibia in the northern part of South Africa, coinciding with the Kalahari Gemsbok National Park (KGNP). The large span of sand contains indications of human occupation from the Stone Age and it is associated with the culture of the previously nomadic Khomani San people and the strategies that permitted them to adapt to harsh desert conditions. They developed a specific ethnobotanical knowledge, cultural practices and a *zeitgeist* related to the geographical features of their environment. The Khomani Cultural Landscape bears testimony to the way of life that prevailed in the region and shaped the site over many thousands of years.

There are also natural sites such as iSimangliso Wetland Park (formerly the Greater St Lucia Wetland Park) in KwaZulu-Natal of South Africa. It has both one of the largest estuary systems in Africa and the continent's southernmost coral reef. More importantly, the park is recognised worldwide as having remarkable unique biodiversity which includes about 521 bird species.

The famous Vredefort Dome is located in the Free State of South Africa. It has been reported that "some 2-billion years ago, a meteorite 10 kilometres in diameter hit the earth about 100km southwest of Johannesburg, creating an enormous impact crater. This area, near the town of Vredefort in the Free State, is known as the Vredefort Dome."

The Cape Floral Region is located in the Western Cape of South Africa. This region "takes up only 0.04% of the world's land area, yet contains an astonishing 3% percent of its plant species. This makes it one of the richest areas for plants in the world and one of the globe's 18 biodiversity hot spots."



The mixed (cultural and natural) heritage site in South Africa is the Maloti-Drakensberg Park in KwaZulu-Natal. The Park has “outstanding natural beauty, Africa's highest mountain range south of Kilimanjaro, and the largest and most concentrated series of rock art paintings in Africa - making it a World Heritage site of both natural and cultural significance” (WHSS, 1997).

Cultural and heritage sites showcase the spectacular and diverse culture, nature and wildlife that South Africa is naturally endowed with, and they are all offered to tourists and visitors that visit all these sites. They also serve as sites for economic activities for South Africans who live and work around the surrounding of these sites. Therefore, their conservation is mutually beneficial to tourists and South Africans alike and especially those who rely on these heritage sites for income generation and livelihood. Pursuant to this, fighting climate change is inevitable for protection and preservation of these sites from the impact and effect of climate change and other bizarre weather threats.

Protecting heritage sites from climate change

The importance of heritage sites and tourism is multifaceted because it builds sustainable development and bolsters needed job creation. Also, the communities and the surroundings where the heritage sites are situated are maintained and made attractive for potential tourists. It is against the backdrop of this that this article strongly accentuates the notion of the conservation of the beautiful heritage sites spread across the country by involving the people, businesses and communities in a sustainable manner (DAC, 2018).

In order to understand the climate change problem, it is important to explain what it means and what triggers changes in climate. Climate change “is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (i.e., decades to millions of years)” (Tompkins & Adger, 2004). Climate change may also “refer to a change in average weather conditions, or in the time variation of weather around longer-term average conditions (i.e., more or fewer extreme weather events)” (Tompkins & Adger, 2004). These bizarre weather events are “caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions. Notably, human activities play prominent and significant roles regarding the causes or trigger of climate change often referred to as global warming” (Tompkins & Adger, 2004).

In order to achieve sustainable preservation of these magnificent natural sites against bizarre weather events, there is need to use a wide range of interventions, particularly carbon dioxide emission reductions interventions in order to reduce the atmospheric heat (Hamilton & McMillan, 2004).

Some specific changes that occur as a result of climate change which can be unbeneficial and damaging to heritage sites are *inter alia*:

Range shifts which are referred to as the way and manner species are distributed within the range or local density but they are being threatened due to climate change and this may cause species to move out of protected areas (Dawson, 2011). Species that are historically known to be residing in protected areas might range shifts if climate change is not curtailed. This might impact the future conservation of these species which might lead to their extinction. The consequence of this would be that tourists who used to visit the sites will have no reason to come and visit because the reason for coming was to come and explore the heritage sites species (Newsome et al., 2012). The ripple effect of this will be felt by those who rely on the heritage sites for enterprises, and livelihood. In order to alleviate this problem, it has been suggested that the application of species conservation planning tools is potent in order to curtail species range shifts caused by climate change. Proactive action of using this model for protected areas is a conservation strategy and it could be both more effective and less costly than inaction or delayed action. The essence of this model is to take proactive intervention in order to find ways of limiting the impact of climate change which would be an essential



complement to reinforce the protected areas for conservation of biodiversity (Lee Hannah et al., 2007). Proper conservation planning and guidance would reveal what interventions need to be deployed in order to successfully account for climate change impacts for the purposes of ensuring sustainable heritage sites management (Banfill et al., 2012).

As part of the conservation strategies, the traditional conservation tools of protection and restoration such as embankments in order to protect water from draining away, are also important and if properly applied could be effective in the face of climate change (Keenelyside et al., 2012). At all times, climate change should always be considered when considering conservation planning in order to get the desired impact reduction. More importantly, a climate change adaptation strategy is potent and better for conservation plans in order to achieve sustainable protection of species, ecosystems, geophysical diversity and ecological processes (Reside et al., 2017).

The importance of rainfall in conservation is also critical as a driver of ecosystem processes and sustainability. This is because rainfall is intrinsically linked to the dynamics of vegetation and species distributions and survival through its effects on soil moisture content and surface water availability. Scientific evidence has shown that climate change is impacting rainfall which leads to natural ecosystem flux but is now vulnerable to the potential climate change effects (Whitehead et al., 2009). Undoubtedly, climate change also poses a serious threat to protected areas especially where they are scattered in isolated landscapes and some are confined within hard park boundaries (Sandra MacFadyen et al., 2018). In order to manage this climate induced crisis, both short and long-term interventions that will monitor the accuracy of the impact of climate change. These interventions are important resources for managing large protected areas like the Kruger National Park (Kruger) in South Africa. For example, the study of MacFadyen et al (2018) shows that “that Kruger’s spatio-temporal rainfall patterns are changing significantly in the short to medium term”. Sustaining the park will therefore ensure cross-cutting research into how climate change mitigation and adaptation should continue to be used in order to ensure consistent rainfall for the sustainability of the park” (Sandra MacFadyen et al., 2018).

There have also been reports of when coral lose their color which is known as coral bleaching and this may be attributable to the impact of impact of climate change. There is a need for strategies to mitigate biodiversity losses subsequent to temperature induced coral mortality. Scientific evidence continues to show that the baseline sea surface temperatures continue to rise and that climate change is the single greatest threat to coral reefs worldwide and this is currently being experienced in South Africa coral heritage sites. Responding to this threat is to identify the specific reef areas where natural environmental conditions are likely to result in low or negligible temperature related bleaching and mortality. Examples of such areas are places of natural resistance to bleaching and reef areas where environmental conditions are likely to result in maximum recovery of reef communities after bleaching mortality has occurred. If these areas are targeted, it could produce a result where environmental conditions seem to increase resistance and resilience during and after largescale bleaching events. This could then be merged into strategic networks of marine protected areas designed to fully exploit conservation of global coral reef biodiversity.

To sustain coral areas, there is need to identify and use “environmental correlates of resistance and resilience to coral bleaching, including factors that reduce temperature stress, enhance water movement, decrease light stress, correlate with physiological tolerance, and provide physical or biological enhancement of recovery potential.” (Jordan & West, 2003).

Similarly, climate warming is having major and potentially unexpected influences on aquatic ecosystems in South Africa. Most of the country’s river and ocean networks are being negatively impacted by the effect of rising water temperature. These impacts have devastating effects on the habitat in the water causing massive shifts and altering habitat availability.



Stabilised water temperatures are critically important for the sustainability of different endangered exotic fish residing in the river and ocean that are sources of tourism research, pleasure and sight-seeing. Warm water and high temperatures caused by climate change are attributable to the shifts of these species and if proactive intervention is not enforced, these species are likely to become extinct (Boddy & McIntosh, 2016). Most of them are vulnerable to climate warming. Curbing these threats to these species from climate warming require intensifying mitigation and adaptation strategies in order to confront the impact in the face of ongoing climate warming” (Zang et al., 2017).

What is concerning is that climate change induced uncertainties are distorting spatial patterns of conservation related outcomes (Hole et al., 2009). To this end, the impact is making it difficult to implement standard conservation planning paradigms. Failure to conserve is a recipe for heritage sites alteration, destruction, damage or extinction. Therefore, reliable climate forecasting is needed for sustainable conservation planning and implementation. Sustaining this strategy requires the support of all role players and stakeholders (Shah et al. 2016). Sustainable conservation is increasingly recognized because natural resource management is both an outcome and driver of social, economic, and development dynamics (Chapin et al., 2010). Therefore, activities causing global warming and climate change should be contained in order to maintain the resilience and sustainability of protected areas and various species that inhabit in these sites (Cumming & Allen, 2017).

South African framework on conservation of heritage sites

First and foremost, the Constitution of South Africa categorises the issues of preservation, protection and conservation within the context of the environment as fundamental rights as espoused in terms of section 24 which provides that the environment should not be harmed, must be protected for the benefits of all, polluting of the environment should be abhorred and prevented, and that the ecology should not be degraded, conservation should be intensified and promoted at all time, ensuring sustainable use of all ecological and natural resources for purposes of development, socio economic goods and services and economic growth. In order to broaden the provision of section 24 to specifically detail areas and sites that must enjoy constitutional protection, preservation and conservation, other types of legislation were put in place to complement section 24 in order for it to achieve its sustainability outlook. These legislations include: The National Environmental Management: Protected Areas Act, 2004 (NEMPAA) was promulgated for the purposes of “providing protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes” The NEMPAA seeks to ensure sustainable protection of areas in South Africa particularly the heritage sites from being degraded and destroyed.

The objectives of the NEMPAA are to continue to provide strong leadership in managing declared protected areas as “part of a strategy to manage and conserve its biodiversity; to provide for a representative network of protected areas on state land, private land and communal land; to promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas; and to promote participation of local communities in the management of protected areas, where appropriate.”

Most of the endangered and exotic species live in the river and oceans of South Africa and the sites they live in serve as sources of tourism attraction. The National Water Act of 1998 provides ample protection for the waters and the species that live in them. In its preamble, the NWA recognises “that the ultimate aim of water resource management is to achieve the sustainable use of water for the benefit of all users.” The species that co-habit in the water and the water itself are protected by the NWA. Recognising the impact of climate change, the NMA advocates for sustainable management and usage of water in South Africa.



Chapter 3 of the NWA mandates the protection of water being a natural resource and that this protection “is fundamentally related to their use, development, conservation, management and control”. The keywords are conservation, protection and management for sustainable water usage. Therefore, to ensure sustainable clean water that will serve all living and non-living thing, it should not be polluted or subjected to the impact of climate change which warming can make river or reservoir dried up. Water heritages sites are not exemption to the impact and effect of pollution and climate change.

Conclusion

Heritage sites are important places that need to be accorded full protection in order to preserve them for present and future generations. Climate change is threatening the sustainability of heritage sites considering that some of these sites are vulnerable to the impact of climate change. Sustaining heritage sites calls for concerted efforts in fighting and curbing global climate change. It is against the backdrop of these climate risks and threats that this article highlights the importance of strengthening compliance, implementation and enforcements of all the policies interventions that have been introduced to retard and stop the impact of climate change.

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