

Valorization of Cultural Heritage in the Promotion of Education for Sustainable Development: Analysis of the Cultural Site Hill of Ambohimanga, Analamanga Region, Madagascar

Andrianaivo Onja Linà¹, Rasamimanana Hantanirina², Andrianarimanana Jean Claude Omer², Rabotovao Sylvain², Andrianjary Myriam³, Razanadrasoa Vololonome Bodomalala², Rakotoson Olivia², Ratiarimananjatovo Narindra², Ratsimandisa Haritiana Zo⁴, Koto-Te-Nyiwa Ngbolua^{5,6}, Robijaona Rahelivololoniaina Baholy^{7,8}

¹Natural Resource Management and Development, University of Antananarivo, Antananarivo, Madagascar

²Higher Normal School, University of Antananarivo, Antananarivo, Madagascar

³Institute of Higher Education Antsirabe Vakinankaratra, Antananarivo, Madagascar

⁴Doctoral School of Inter-Epistemological Sciences, Educational Sciences, Antananarivo, Madagascar

⁵Department of Biology, Faculty of Science, University of Kinshasa, Kinshasa, Democratic Republic of the Congo

⁶National Scientific Council, Ministry of Scientific Research and Technological Innovation, Democratic Republic of the Congo

⁷Engineering and Industrial Process, Agricultural and Food Systems, Polytechnic High School of Antananarivo, University of Antananarivo, Antananarivo, Madagascar

⁸Polytechnic High School of Antananarivo, University of Antananarivo, Antananarivo, Madagascar

Email: baholy.robijaona@univ-antananarivo.mg

Abstract:

International and national entities like UNESCO, the Malagasy Cultural Heritage Policy Framework (CPPC), and the Malagasy Ministry of Culture and Communication (MCC) advocate for leveraging cultural heritage as a significant catalyst for sustainable development. They acknowledge the historical, cultural, environmental, and touristic wealth intertwined with cultural heritage within the framework of Education for Sustainable Development (ESD) for the populace. This study aims to illustrate how cultural heritage can genuinely contribute to enhancing and advancing education towards sustainable development. It scrutinizes the potential correlation between artifacts and heritage assets of cultural sites and the socio-cultural, environmental, and economic facets of sustainable development, with a focal point on the Ambohimanga hill in the Analamanga region. Findings reveal that cultural sites embody traits that align with the goals of ESD, via their tangible and intangible heritage assets. They facilitate a heightened consciousness of our lineage and our cultural and social identity, thereby ensuring the perpetuation of our heritage for posterity. Moreover, they play a role in conserving the environment and biodiversity by housing endemic and medicinal fauna and flora, thus safeguarding their existence for future generations. Furthermore, they spur local and national economic growth by drawing tourists, generating revenue, and fostering employment opportunities. Propagating education about cultural heritage through cultural site visits presents a promising avenue as a component of ESD

Keywords:

Cultural heritage; Artifacts; Sustainable development; Education; Ambohimanga hill

I. Introduction

The concept of Sustainable Development was defined in 1987 by the Brundtland Report as development that « *meets the needs of the present without compromising the ability of future generations to meet their own needs.* » This concept aims to reconcile the social, environmental, economic, and cultural aspects of development. The United Nations' Sustainable Development Goals (SDGs) for 2030 also recognize heritage sites as significant contributors to sustainable development.

According to Ekoume's research (2021), cultural education is now recognized as a crucial factor for the socio-cultural, political, and economic development of a country. Culture plays a crucial role in sustainable development. A significant portion of the world's environmental, social, and economic issues are deeply rooted in cultural activities and human decisions. Consequently, addressing these problems effectively often requires culturally-informed solutions. Thus, models of sustainable development focused solely on economic or environmental aspects are unlikely to succeed without incorporating cultural perspectives (Dessein *et al.*, 2015).

To achieve the SDGs through culture, UNESCO advocates for the integration of cultural heritage into formal and informal educational systems.

As a result, education in Madagascar, whether formal or informal, is moving towards a sustainable development-oriented approach. The Malagasy Ministry of National Education has initiated reforms in school curricula by integrating themes related to sustainable development, thereby promoting the use of cultural heritage in teaching and learning.

On the other hand, the Malagasy Cultural Heritage Policy Framework (CPPC) and law No. 2005-006 on the National Cultural Policy in Madagascar emphasize that Malagasy cultural heritage should contribute to defining the progress of society, and that no true and sustainable development can occur without considering the values transmitted by ancestors. However, according to a study conducted by Anonymous in 2012, cultural heritage in Africa represents a significantly underutilized development potential.

This observation was confirmed by UNESCO in 2019, highlighting that African countries pay little attention and value to their cultural and heritage resources in terms of their contribution to poverty alleviation. This situation is explained by several factors such as ignorance, lack of awareness or information, and especially the multiple priorities that the population and states must face, such as food, health crises, clean water, and security, among others. However, these countries in the Global South abound with heritage resources, whether historical, cultural, or natural.

Given these different contexts, how can cultural heritage truly contribute, enrich, and promote education for sustainable development? Cultural heritage can be transformed into educational spaces to promote ESD, if used as a living resource to effectively contribute to sustainable development in each of its three dimensions (socio-cultural, environmental, and economic). These various situations prompt us to propose a practical guide to visits highlighting the artifacts and heritage assets of cultural sites. We could then analyze these artifacts and heritage assets in relation to sustainable development in each of its three dimensions, using the Ambohimanga hill in the Analamanga region as an example. This approach is relevant to address our issue on how to leverage cultural heritage and promote ESD among site visitors.

II. Research Methods

To confirm the hypothesis proposed earlier, the following actions were carried out:

- a. Bibliographic research focusing on the Ambohimanga-Rova site, particularly on works such as those by Callet (1982) entitled "Tantara ny Andriana eto Madagasikara" , Rafolo (2000) entitled "Cité royale, bois sacré et arbres royaux d'Ambohimanga: un exemple de paysage culturel associatif malgache des Hautes Terres" , as well as the Communal Development Plan of the rural municipality of Ambohimanga Rova (PCD) from 2008.
- b. Direct observations were conducted, accompanied by photo documentation focusing on the cultural, historical, and environmental elements of the site under study.
- c. Surveys were conducted with site officials, notably the Office of the Cultural Site of Ambohimanga-Rova (OSCAR), to gather information on the cultural, historical, and environmental elements of the site under study.

The activities aim to develop a practical visit guide for cultural site facilitators. This guide highlights the artifacts and heritage assets, encompassing all the tangible and intangible treasures available at the sites. An analysis of the artifacts and heritage assets of the Ambohimanga site, as presented in the practical guide, is then conducted. The objective of this analysis is to determine if these artifacts and heritage assets can effectively contribute to education for sustainable development in each of its three dimensions (socio-cultural, environmental, and economic) for site visitors.

III. Results and Discussion

The bibliographic reviews, direct observations on-site, and surveys with site officials all reveal the exceptional historical, cultural riches, and biodiversity of the site as presented in the practical visit guide. These valuable resources can be leveraged to promote education for sustainable development.

3.1 Presentation of Historical, Cultural Artifacts, and Biological Diversity of the Site in the Guide

This guide highlights the multiple cultural, historical interfaces, and biological diversity present on the site. These elements are essential for addressing the themes of education for sustainable development (ESD) through its three dimensions, thus offering visitors a rewarding opportunity for exploration and learning.

Table 1. Historical, Cultural Artifacts, and Biological Diversity of the Site Presented in the Guide

Cultural artifacts	Historical artifacts	Floristic and faunistic assets (biodiversity)
<p><i>The places of worship</i></p> <ul style="list-style-type: none"> ✚ The sacred stone to the east of the public square - <i>Fidasiana</i> ✚ '<i>Fasan'Andriana</i>' or royal tombs ✚ The northeast corner inside the royal house of Andrianampoinimerina <p><i>Exploration of sites of traditional rituals</i></p> <ul style="list-style-type: none"> ✚ '<i>Fandroana</i>' or royal bath, or the Malagasy New Year in the '<i>Dobo masina</i>' or sacred basins ✚ The '<i>tanguin</i>' ordeal ('<i>tangena</i>') at the <i>Kianja d'Ambatorangotina</i>: site of royal edicts and court <p><i>Traditional games and skills</i></p> <ul style="list-style-type: none"> ✚ « <i>Manda</i> » or « <i>Tamboho</i> » (wall) ✚ « <i>Vato Fanorona</i> » or Game board, Malagasy chessboard type ✚ Art of basketry, embroidery and Malabary garment making ✚ Terraced rice cultivation 	<p>Exploration of the site's history and the kings through informational panels</p> <p><i>The archaeological and historical remnants of the sites</i></p> <ul style="list-style-type: none"> ✚ '<i>Vavabady</i>' or stone gateways ✚ '<i>Fidasiana</i>' or '<i>Kianja</i>' or public square ✚ '<i>Manda</i>' or '<i>Tamboho</i>' or walls ✚ '<i>Lapa</i>' or the royal citadel itself ✚ The cattle pit ✚ '<i>Dobo masina</i>' or the sacred ponds ✚ Some historical remnants such as furniture, beds, kitchen utensils, <i>Fanorona</i> (a traditional Malagasy board game), tables, watches, etc. ✚ '<i>Fasan'Andriana</i>' or royal tombs. ✚ '<i>hazon'andriana</i>' or royal trees ('<i>Amontana</i>' and '<i>Aviany</i>') 	<p><i>The relics of the sacred original forests</i></p> <p>Moist evergreen montane forest, steppes, and savannahs containing the following :</p> <ul style="list-style-type: none"> ✚ Endemic plants: <i>Vandrika</i> (<i>Craspidospermum verticillatum</i> Bojer), <i>Ambora</i> (<i>Tambourissa thouvenotii</i> Danguy) etc. ✚ Medicinal plants: <i>Dingadingana</i> (<i>Psiadia altissima</i>), <i>Famonodito</i> (<i>Plectaneia stenophylla</i> Jum), <i>Hazotokana</i> (<i>Brachylacna ramiflora</i>), <i>Sodifafana</i> (<i>Kalanchoe prolifera</i>) etc. ✚ Endemic animals: leopard <i>Katsatsaka maitso</i> (<i>Phelsuma madagascariensis</i>), the carnivore (<i>Viverricula rasse</i>) and the bird <i>Kiriokirioka</i> (<i>Merops superciliosus</i>) etc. ✚ The museum showcasing the strategies and actions for forest protection from King Andrianampoinimerina (1787) to the reign of Ranavalona II (1883) e.g.: The law prohibiting the



		cutting of forest wood, the law against bushfires, etc. Fines were implemented to enforce these laws.
--	--	---

This table underscores several key elements. Firstly, it highlights the paramount importance of cultural elements in preserving the Malagasy identity. The country's cultural richness is manifested through places of worship, traditional rituals, games, and typical craftsmanship. They allow visitors to reconnect with their origins and deepen their understanding of their cultural and social identity. Furthermore, the archaeological and historical remains, along with the explanations provided by guides, offer visitors the opportunity to deepen their understanding of Madagascar's history, with a focus on the period of the Merina kingdom. Finally, this result also emphasizes the importance of raising awareness among visitors about the protection of the environment and biodiversity. The relics of the original and sacred forests, as well as the endemic and medicinal plant species present on the site, serve as a reminder of the need to combat climate change and preserve nature for future generations.


3.1 Artifacts and Heritage Assets: Towards Socio-Cultural Sustainable Development

The artifacts and heritage assets of the site provide visitors with tangible references to grasp the socio-cultural dimension of sustainable development.

Table 2. Socio-Cultural Dimension of Sustainable Development through Artifacts and Heritage Assets of the Site

Artifacts and heritage treasures of the site to visit	Objectives of visiting the site	Visitors' activities
<p>' <i>Hazon'andriana</i> ' or royal trees: these are sacred trees that characterize royal residences</p> 	<p>The discovery of sacred and medicinal trees according to Malagasy beliefs</p>	<p>Direct observation and taking photos of the '<i>hazon'andriana</i>', followed by listening to the guides' explanations about these trees</p>
<p>The sacred stone to the east of the public square '<i>Fidasiana</i>,' where sacrifices are made</p> 	<p>Information about Malagasy beliefs related to rituals and animal sacrifices</p>	<p>Visit to a place of worship called '<i>sacred stone</i>' or <i>pierre sacrée</i> where traditional religious ceremonies take place, such as the enthronement of sovereigns and sacrifices, still frequented by pilgrims. Observations of blood collected and poured on the sacrificial stone as well as on the corners of royal tombs suggest that sacrifices continue to be practiced by followers of traditional religion</p>

Artifacts and heritage treasures of the site to visit	Objectives of visiting the site	Visitors' activities
<p>"The cattle pit"</p> 	<ul style="list-style-type: none"> + The role of zebus in Malagasy belief + Identifying African contributions, particularly zebu breeding, to Malagasy civilization 	<p>Visit to the cattle pit dedicated to the breeding of sacred cattle called 'Omby volavita'</p>
<p>"Dobo masina " or sacred basin"</p> 	<ul style="list-style-type: none"> + Information about the ritual ceremonies of 'Fandroana' or 'Taombaovao' in Malagasy culture, also known as the 'royal bath' + Identifying Arab influences, particularly in the field of astrology, on Malagasy civilization 	<p>Direct observation and explanations from the guides regarding this sacred basin, traditionally used for royal baths, where the sovereign takes their bath first.</p>
<p>The royal tombs</p> 	<ul style="list-style-type: none"> + Information about the beliefs of the Malagasy people regarding ancestor worship, emphasizing the connections between the living and the dead + Determining African contributions, particularly Malagasy beliefs based on ancestor worship, to Malagasy civilization 	<p>Visit to the royal tombs, still today a place of worship frequented by pilgrims.</p>
<p>Mahandrihono, the royal palace of Andrianampoinimerina</p> 	<p>African contributions (Malagasy beliefs based on ancestor worship) and Arab influences (cosmological arrangement and astrology in Malagasy culture) on Malagasy civilization</p>	<p>Visit inside the "Lapa" of Andrianampoinimerina, accompanied by explanations from the guides for:</p> <ul style="list-style-type: none"> + Viewing the archaeological and historical remnants (furniture, beds, kitchen utensils, weapons, etc.) used by the king. + Observing the sacred space situated in the northeastern corner within the inner sanctum of Andrianampoinimerina's royal compound, where not only the king's spirit but also those of other royal members were summoned. + Allowing visitors to discover

Artifacts and heritage treasures of the site to visit	Objectives of visiting the site	Visitors' activities
		for themselves the cosmological and astrological layout of the house of Andrianampoinimerina (<i>Mahandrihono</i>).
<i>Terraced cultures around the site</i>	Asian influences on Malagasy civilization (terraced rice fields and terrace farming)	Visitor observation: tiered rice paddies and terraced crops surrounding the site (material civilization). The terraced farming in the Central Highlands bears resemblance to those found in monsoon Asia, as does rice, a staple food both in monsoon Asia and for the Malagasy people.
« <i>Kianja d'Ambatorangotina</i> », Royal edict site and courthouse	Information about the ritual ceremonies of the <i>tangena ordeal (Fisotroana tangena)</i> and about the way justice was administered during the Merina Kingdom."	Visit to the " <i>Kianja d'Ambatorangotina</i> " justice square, where justice was administered through the trial of <i>tanguin (Fisotroana tangena)</i> , involving the ingestion of a poison concoction by those suspected of opposing royal authority or being guilty of a serious offense.
« <i>Vato Fanorona</i> » or game board, Malagasy chessboard type. 	The love and practice of a traditional Malagasy game.	Visit this traditional playground area where traditional games like " <i>Vato Fanorona</i> " were played, similar to a Malagasy chessboard, dating back to the Merina kingdom era.
<i>Manda ou Tamboho Malagasy</i> (Wall), enclosure surrounding the royal citadel	Traditional Malagasy craftsmanship during the kingdom period: <i>Manda</i> or <i>Tamboho Malagasy</i>	Upon arrival at the royal citadel, visitors immediately notice the " <i>Manda</i> " or " <i>Tamboho</i> ", a formidable wall constructed using a combination of fine sand, stone aggregates, and mortar made from lime and egg whites.
The <i>Malagasy artisanal products</i> displayed in small wooden huts shaped in the style of the royal	Traditional Malagasy craftsmanship: Malagasy handicrafts.	Direct observation of artisanal products and craftsmanship such as lacework, embroidery, basket weaving, sculpture, etc., encountered on the site.


Artifacts and heritage treasures of the site to visit	Objectives of visiting the site	Visitors' activities
palace of Andrianampoinimerina		
Information panels about the site	Raising awareness about national history, especially the history of Imerina	Reading and note-taking on the history of the site and its kings through information panels and the guides' narratives
« <i>Fidasiana</i> » or « <i>Kianja</i> » or public square (a place for meetings and gatherings between the sovereign and the people)	Raising awareness about national history, especially the history of Imerina	Direct observation and photography of the " <i>Fidasiana</i> " or " <i>Kianja</i> " square.
The historical artifacts/remnants displayed inside the two ' <i>lapa</i> ' or palaces of Queen Ranaivalona II	Increased awareness of national history, with particular emphasis on: <ul style="list-style-type: none"> + famous sovereigns of the Merina kingdom and Madagascar + The evolution of Madagascar's relations with foreigners during the time of the Malagasy kingdom + The attempts at unification of Madagascar in the 19th century 	Visiting the interior of these two " <i>Lapa</i> " of Ranaivalona II, with guidance from the guides: <ul style="list-style-type: none"> + Observing photos of the kings and queens. + Listening to and taking notes on the guides' narratives regarding the history of the conquests of the kings of Imerina (Andrianampoinimerina and Radama I) in other kingdoms, with the aim of unifying Imerina and Madagascar. + Observation of archaeological and historical remains such as furniture, beds, kitchen utensils, tables, watches, etc., offered by Europeans to Malagasy kings and queens.
Medicinal plants of the site. 	Information and improvement of therapeutic knowledge based on traditional medicinal plants	Direct observation of medicinal plants accompanied by listening to the guides' explanations regarding these medicinal plants on the site.

Table 2 presents several aspects of Malagasy beliefs: direct observation or visiting various places of worship, such as royal tombs, the northeast corner inside the royal compound, or the sacred stone to the east of the public square, also frequented by pilgrims. This includes how the living and the dead are perceived, which reflects the intangible civilization. Similarly, visiting places where various ritual ceremonies took place, such as the "Fandroana" or royal bath, or the tanguin ordeal, helps inform and highlight Malagasy traditions and customs. Visitors can directly observe traditional know-how, such as terraced

rice fields or stepped rice paddies. Additionally, these various temples, ritual ceremonies, and traditional know-how of the site help identify foreign influences in Malagasy civilization, such as those from Africa, Arabia, and Asia. On the site, information panels, guides' narratives about the site's history and kings, direct observation of archaeological and historical remains enable visitors to learn more about national history, particularly that of Imerina. Finally, the presence of medicinal plants on the site provides visitors with information and an improvement in therapeutic knowledge from traditional medicinal plants.

3.3 Artifacts and Heritage Assets: Towards Environmental Sustainable Development

The site is teeming with artifacts and heritage assets that serve as invaluable sources of knowledge about the environmental aspect of sustainable development. This abundance provides visitors with the opportunity to deepen their understanding of this specific dimension, thus enriching their experience on the site.

Table3. Environmental Integration of Artifacts and Heritage Assets for Sustainable Development.

Artifacts and heritage treasures to visit	Objectives of visiting the site	Visitors' activities
<i>The forests surrounding the site</i>	<ul style="list-style-type: none"> ✚ Informing and establishing the relationship between climate and vegetation ✚ Raising awareness about the causes and the measures taken to combat climate change and its repercussions 	Direct observation of the types of forests or vegetation life (dense forest, steppe, savanna, etc.) and the type of climate (high-altitude tropical climate close to tropical humid climate) encountered in the environment.
<i>The forests, endemic plants, and medicinal plants of the site</i>	<ul style="list-style-type: none"> ✚ Identifying the main forest products, distinguishing the causes and consequences of environmental degradation, and actions to be taken for its protection. ✚ Identifying the causes of environmental problems and their consequences. ✚ Informing about environmental protection and biodiversity (endemic and medicinal plants). 	Exploring the forests: <ul style="list-style-type: none"> ✚ To distinguish the forest products (construction and heating timber, endemic and medicinal plants, etc.); the environmental issues encountered in the environment (illegal logging for firewood, furniture making, deforestation, etc.). ✚ To identify living beings (endemic and medicinal plants) and to appreciate the role these beings play in society (medicinal plants for treating certain illnesses, endemic plants to attract tourists).

Artifacts and heritage treasures to visit	Objectives of visiting the site	Visitors' activities
<i>Environmental museum of the site</i>	<ul style="list-style-type: none"> ✚ Identifying the causes of environmental problems and their consequences. ✚ Informing about environmental protection and biodiversity (endemic and medicinal plants). 	<p>The environmental museum of the site:</p> <ul style="list-style-type: none"> ✚ Identifying the causes of environmental problems and their consequences, and raising awareness about environmental protection and biodiversity (endemic and medicinal plants). ✚ Reading posters displaying the strategies and actions adopted by the site authorities (OSCAR) to preserve the environment. ✚ To observe the posters displaying all the endemic and medicinal plants (dried plants attached to papers) found on the site (with their characteristics and roles).

According to Table 3, direct observation and visiting different areas are essential to raise visitors' awareness about various environmental aspects. Firstly, observing the surrounding forests helps establish connections between forest types and local climate, thereby assisting visitors in understanding the causes of climate change and the measures taken to combat it. Additionally, this observation also helps identify the causes of environmental issues and their consequences, while highlighting the richness of local biodiversity, including endemic and medicinal plants. This awareness fosters a sense of urgency regarding the protection of the environment and biodiversity.

Furthermore, visiting the museum showcasing the strategies and actions implemented for forest protection during the Merina and Malagasy kingdom era, as well as by current site authorities (OSCAR), enhances environmental awareness. Displays of endemic and medicinal plants, presented as dried plants with their characteristics and roles, complement this awareness by providing visitors with a thorough understanding of the richness of local biodiversity and the importance of its preservation.

3.4 Economic Valorization of Artifacts and Heritage Assets for Sustainable Development

The economic dimension of sustainable development is also reflected through these artifacts and heritage assets, providing visitors with an opportunity to deepen their understanding of this crucial aspect.

Table 4. Economic Valorization for Sustainable Development

Artifacts and heritage treasures to visit	Objectives of visiting the site	Visitors' activities
<i>The medicinal plants of the site</i>	Promoting/developing the pharmaceutical industry based on traditional medicinal plants	Direct observation, coupled with listening to the guides' explanations about these medicinal plants on the site, informs visitors that therapeutic knowledge about these plants can promote/develop the pharmaceutical industry based on traditional medicinal plants.
<i>The tourists of the site</i>	Promoting/developing sustainable tourism	Direct observation of both domestic and foreign tourists, curious to learn more about Malagasy history, culture, and biodiversity, enables visitors to appreciate the role that a cultural site plays in the development of sustainable tourism.
<i>The activities adjacent to tourism on/in the vicinity of the site</i>	Discussing/analyzing the role of tourism in economic development (job creation and foreign exchange earnings)	Direct observation of the development of ancillary activities to tourism such as tourist guides, handicrafts, transportation, and restaurants allows visitors to get an idea of the benefits that the tourism sector can bring to the Malagasy economy.

According to Table 4, direct observation and site visits provide visitors with several perspectives on its importance and impact. Firstly, observing the medicinal plants present on the site enables visitors to become aware of the therapeutic potential of these plants and encourages the development of the pharmaceutical industry based on traditional medicinal plants. This awareness thus promotes the valorization of ancestral knowledge and the associated economic development potential.

Furthermore, visiting the site attracts the interest of national and foreign tourists eager to learn more about Malagasy history, culture, and biodiversity. This highlights the importance

of cultural sites in promoting sustainable tourism and preserving the country's cultural and natural heritage. This appreciation helps strengthen the site's position in the tourism industry and encourages its long-term conservation.

Finally, the implementation of ancillary tourism activities such as tourist guide services, artisanal activities, restaurants/hotels, and transportation demonstrates the crucial role of the cultural site in local economic development. These activities generate employment, contribute to foreign currency inflows, and stimulate the local economy, further justifying the importance and investment in the preservation and promotion of the cultural site in the eyes of visitors.

3.5 Discussion

a. The Heritage Assets of Cultural Sites: A Dimension of Education for Sustainable Development (ESD)

This article primarily focuses on the exhibition and analysis of heritage assets, both tangible and intangible, available at cultural sites. In light of this analysis, it emphasizes that cultural sites, through their historical and cultural artifacts and biodiversity, can contribute to promoting the three dimensions of sustainable development (socio-cultural, environmental, and economic) among visitors. Rabemanantsoa (2007) and Barthes et al. (2020) highlight the crucial importance of cultural sites in national development, recognizing them as symbols of identity and significant contributors to the economy.

In 2015, the United Nations acknowledged the importance of culture and heritage in sustainable development through the 2030 Agenda and its seventeen Sustainable Development Goals (SDGs). Cultural heritage is explicitly highlighted in Goal 11, which focuses on Sustainable Cities and Communities, particularly in Target 11.4, which aims to "*protect the world's cultural and natural heritage.*" Additionally, its significance is reflected in a more indirect manner in other goals, including SDG 4 on Education, SDG 8 on Work and Economic Growth, and SDG 12 on Consumption and Production (Labadi et al., 2021).

In light of the ongoing degradation of the natural environment, it is essential to protect the remaining resources for the sake of future generations. The Narinda peninsula, located in the Analalava district in the northwest of Madagascar, still retains its original natural beauty due to its isolation and the unwavering respect for customs and taboos upheld by the local Sakalava people (Tombomiadana et al., 2020).

Furthermore, Nocca (2017) stated that the advantages of conserving and regenerating cultural heritage extend beyond tourism impacts, as case studies reveal that these benefits are multidimensional, encompassing economic, social, environmental, and other aspects. The valorization of cultural heritage as a tool for social, environmental, and economic development deserves to be promoted. Heritage has always evolved and constantly adapted to contemporary social, economic, environmental, and cultural realities.

As revealed by Basilico (2010), cultural heritage now takes on an entirely new dimension. It is no longer seen as a peripheral sector but holds a central position in societal development, not only culturally but also economically and politically. Thus, it is now conceivable to associate cultural heritage at the core of sustainable development, as emphasized by Diemer (2013), with culture being one of the pillars of sustainable development.

Cultural heritage is a lever for socio-economic development in Madagascar because it promotes tourism, creates job opportunities, and fosters local entrepreneurship. By preserving

traditional crafts and practices, communities can enhance their economic resilience. Additionally, cultural heritage strengthens social cohesion and identity, encouraging community involvement and pride. Investing in heritage can lead to sustainable development, attracting both local and international interest while ensuring the protection of Madagascar's unique cultural legacy.

Thus, cultural heritage and sustainable development are two interdependent concepts. Benabbas and consorts (2017) acknowledge that these notions exhibit significant correspondences, expressing the desire to further integrate the temporal dimension and delve deeper into the past, present, and future of societies, with a logic of transmission and intergenerational solidarity. Heritage should be regarded as a resource that we have a duty to protect in order to pass it on to future generations.

The UNESCO statements in 2012 and 2019 confirm the crucial role of cultural heritage as an extremely valuable resource to assist countries in achieving sustainable development goals in their socio-cultural, environmental, and economic dimensions. The features of Education for Sustainable Development (ESD) are evident through heritage assets such as cultural artifacts, historical elements, and biodiversity found in cultural sites.

b. Cultural Sites: Witnesses of National History and Symbols of a Country's Cultural Identity

The cultural site of Ambohimanga bears witness to the history of Madagascar, particularly that of the Imerina region, through the presence of historical and archaeological remains. It also embodies Malagasy cultural identity through its practices and deep respect for traditions, ancestral knowledge, traditional medicinal plants, and artisanal products, reflecting both material and intangible civilization.

On the hill of Ambohimanga, the spatial practices of three user groups intersect. For the local villagers, Ambohimanga is both a vital part of their environment and a significant site for pilgrimage and cultural heritage. Pilgrims, mainly from Madagascar and Réunion, prioritize access to various worship sites known as doanys. Western tourists, on the other hand, are primarily drawn to the royal domains as elements of global cultural heritage and appreciate the presence of "*tradipractitioners*" who, through their rituals, give the site an authentic appearance, turning sightseeing into a more immersive experience (Saretzki & May, 2011).

According to *Ordinance No. 82-029 of 1982* of the Republic of Madagascar, the preservation of national heritage is essential as it reflects a profound relationship between individuals, their ancestors, and their homeland. According to *Ordinance No. 82-029 of 1982* of the Republic of Madagascar regarding the protection, safeguarding, and conservation of national heritage, Malagasy cultural identity is conveyed through national heritage, which "*reflects a comprehensive relationship between the individual, their ancestors, and their homeland*" Thus, knowledge of national history is of paramount importance to educate enlightened citizens who understand their past and value their unique national culture.

Cultural differences can shape the processes, practices, and outcomes of collective memory, and culture's impact on collective memory evolves both over an individual's lifetime and across generations (Wang, 2008). As a guardian of memory, it immortalizes moments from the past and gives meaning to the environment in which society evolves, thereby reinforcing a sense of belonging to a community. Similarly, the work of Benabbas and consorts. (2017) emphasizes that cultural heritage serves as both a memory aid and an identity

vector. Its preservation is indeed considered a privileged method for ensuring social continuity.

Moreover, cultural heritage, passed down through generations, helps people situate themselves within a temporal continuum and provides a given territory with distinctive characteristics that form the basis of collective identities. Therefore, incorporating cultural heritage into development programs and planning projects—including traditional practice spaces, sacred elements, archaeological sites, and historically or aesthetically valuable architectural elements—is essential (Cissé, 2012).

According to UNESCO in 2002 and the research of Barillet and consorts (2023), cultural heritage is an essential element of identity, as it reveals the beliefs, values, and knowledge of the civilizations that created or influenced it. It constitutes a collective asset passed down from generation to generation, providing present generations with temporal references in a constantly evolving world.

c. Contribution of Cultural Sites to Environmental Conservation and Biodiversity

The hill of Ambohimanga stands out today as one of the few hills still covered with forest in the Analamanga region, due to its sacred status. These sacred forests harbor a diversity of endemic and medicinal plant species unique to Madagascar. Madagascar boasts a diverse and distinctive array of flora, with approximately 13,000 plant species, 80% of which are endemic to the island. Many of these plants are utilized in traditional medicine to address various ailments, including infectious diseases (Hudson et al., 2000). To preserve this environment, protection measures are implemented by local communities, site managers, in collaboration with the Ministry of Environment and gendarmerie forces. Thus, cultural sites can play a crucial role in the long-term preservation of natural resources by maintaining ecological balance and limiting environmental impacts.

Every region of Madagascar has its own remedies to alleviate the suffering of sick individuals. This is undoubtedly a result of the diversity of ecosystems, abundant natural resources, and the unique customs and traditions of each tribe in every locality (Miladera et al., 2020). As emphasized by Guevremont (2014), environmental protection has become a vital concern that must be integrated into state development policies to achieve sustainable development. UNESCO also stated in 2015 that cultural heritage significantly contributes to environmental sustainability by promoting biodiversity conservation, sustainable management of natural resources, and resilience to natural disasters.

There is a strong positive correlation between tourism and economic growth, underscoring the sector's crucial role in advancing Madagascar's economy. However, the influx of tourists has also been linked to higher carbon emissions, highlighting the importance of adopting sustainable tourism practices to reduce environmental effects (Andrianady et al., 2024).

Madagascar's advantage over other countries lies in its ability to combine the management and protection of its exceptional ecological heritage with a new form of tourism: ecotourism (Froger, 2006). All these endemic and medicinal plants in the country are indeed part of its wealth and heritage, and their preservation contributes to the protection of biodiversity. Elamé (2022) underscores the role of cultural heritage as a resource and vector for Education for Sustainable Development. It can be used to raise awareness, educate, and empower sub-Saharan Africans about the crucial role of indigenous knowledge in preserving

forests, biodiversity, and ecosystem management. Cultural sites can be seen as essential protected areas for the conservation of the environment and biodiversity, preserving a country's endemic and medicinal plant and animal species for future generations.

As Anup stated, ecotourism plays a crucial role in managing cultural heritage, conserving the environment, and fostering social and economic development at both local and national levels. By attracting tourists, it generates financial benefits that support conservation efforts and overall regional development. The primary goal of ecotourism is effective environmental management, and projects are planned and evaluated with this objective as a central focus (Anup, 2018).

d. Contribution of Cultural Sites to Economic Development

Madagascar features a distinctive population that blends African and Asian influences, seamlessly merging ancient traditions with contemporary life. It offers tourists a broad range of experiences, from sun and sand to nature and cultural exploration, as well as adventure tourism (Pawlicezk & Mehta, 2008).

Cultural sites are abundant in history, culture, and environment, making them attractive tourist destinations for both domestic and international travelers. The development of complementary activities to tourism on these sites, such as tour guide services, artisanal activities, restaurants/hotels, and transportation, demonstrates their significance in economic development by creating jobs and contributing to foreign currency inflow.

Madagascar's highlands feature numerous sacred sites with cultural and spiritual significance. Key locations include the twelve sacred hills around Antananarivo, such as Ambohimanga, and other notable sites in the Andringitra massif like Amboromena, the Riandahy and Rimbavy waterfalls, Velontsoa forest, and the An'alanja and Tsaranoro dry forests. These sites, rich in cultural heritage and natural beauty, hold potential for unique approaches to nature conservation and sustainable development (Rabetaliana & Schachenmann, 2003).

According to the Malagasy Ministry of the Interior and Decentralization in 2015, the presence of significant cultural heritage can stimulate new economic activities, particularly in tourism, and directly benefit local populations through the income generated by the tourism sector. Cultural sites also allow surrounding communities to increase their income through commercial activities such as crafts, restaurants, and accommodation. In Antananarivo, a city with a significant African Diaspora, heritage plays a crucial role in everyday life. It is also influenced by global factors like the designation of sites as UNESCO World Heritage, the growth of international tourism, and the commercialization of cultural aspects (Boswell, 2011).

Madagascar central highlands host the most important built Cultural Heritage sites: the royal fortifications of Ambohimanga (UNESCO World Heritage site since 2001), and the Antananarivo Upper Town, encompassing the Rova royal palace complex (Ciampalini and al., 2019). The research conducted by Freedman and consorts (2011) as well as by Benabbas and consorts (2017) confirms that cultural heritage is a major asset for economic development. It attracts investments and ensures the creation of local, decent, and stable jobs, some of which may be related to tourism. Additionally, research piloted by Andrianady and *al.* in 2024 reveals a strong positive correlation between tourism and economic growth, highlighting the sector's pivotal role in driving Madagascar's economy. Conversely, tourist arrivals were found to

contribute to increased carbon emissions, emphasizing the need for sustainable tourism practices to mitigate environmental impacts (Andrianady et al., 2024).

UNESCO confirms the fundamental role of cultural heritage in poverty reduction by creating jobs and stimulating tourism growth, which is considered an important economic dimension by many countries. Furthermore, cultural heritage is a driver of economic and territorial development, promoting cultural tourism and involving local populations in sustainable tourism development. Besides, cultural heritage is increasingly seen as both a component and a means for socio-economic development. The discussion highlights that preserving heritage is now acknowledged as a fundamental aspect of development in both '*developed*' and '*developing*' nations' (Loulanski, 2006).

In summary, cultural sites play a crucial role in attracting tourists to a territory and contribute to local economic development, making them a valuable resource for local communities and the national economy as a whole.

IV. Conclusion

Cultural sites are ideal learning environments for promoting education for sustainable development (ESD) through their rich tangible and intangible heritage, such as cultural artifacts, historical items, and biodiversity. They provide a unique opportunity to better understand our roots and cultural and social identity, thus ensuring the survival of our heritage for future generations. Moreover, they contribute to the preservation of the environment and biodiversity, support local economic development by attracting tourists, generating revenue, and creating jobs.

Therefore, cultural sites can be regarded as essential educational resources that contribute to promoting ESD in its three dimensions among visitors. Visiting these sites aligns with the recommendations of international and national conventions and organizations such as UNESCO, the Cultural Heritage Policy Framework for Madagascar (CPPC), and the Ministry of Communication and Culture (MCC), which recognize the integration of cultural heritage as a major contribution to sustainable development.

The influx of numerous visitors to cultural sites presents an excellent opportunity to promote ESD. However, it is essential to emphasize that the mere presence of cultural heritage assets is not sufficient to attract visitors; adequate services, offerings, and tourist infrastructure are also necessary. Thus, collaboration among stakeholders involved—including site managers, the private sector, local communities, local authorities, and national governments—is crucial for the valorization and preservation of cultural sites, as well as for providing visitors with quality services and infrastructure.

References

- Andrianady, R. J., Jonathan, A., Alyda, C., & Randrianantenaina, S. K. (2024). Tourism's Impact on Inclusive Growth and Co2 Emissions in the Case of Madagascar .SSRN Scholarly Paper, 4803923, 1-18. <https://doi.org/10.2139/ssrn.4803923>
- Anonymous. (2012). Les villes africaines et leurs patrimoines (Collection patrimoines africains). Riveneuve éditions. <https://www.africabib.org/rec.php?RID=342161423>
- Anup, K. C. (2018). Tourism and its role in environmental conservation. *Journal of Tourism and Hospitality Education*, 8, 30-47. <http://dx.doi.org/10.3126/jthe.v8i0.20009>

- Barillet, C., Joffroy, T. & Longuet, I. (2023). Patrimoine culturel et développement local. Un guide à l'attention des collectivités locales et africaines. Grenoble: CRATerre, UNESCO. 108p. <https://craterre.hypotheses.org/197>
- Barthes, A. Alpe, Y. & Blanc-Maximin, S. (2020). L'éducation au patrimoine, un outil pour un développement local durable, ou une instrumentalisation de l'éducation au service de la labellisation des territoires? HAL open science. Hal-02471993, version 1. <https://amu.hal.science/hal-02471993>
- Basilico, S. (2010). Redéfinir le Patrimoine culturel à l'heure de la globalisation. HAL open science, version 1, 1-16. https://archivesic.ccsd.cnrs.fr/sic_00490004
- Benabbas, M., Djaghroui, D. & Afren, R. (2017). Patrimoine et développement durable dans le contexte algérien: une dualité complémentaire ou opposée? *Courrier du Savoir*, 24, 09-18. <https://revues.univ-biskra.dz/index.php/cds/article/view/2232>
- Boswell, R. (2011). Managing heritage in Antananarivo, Madagascar. *Journal of Contemporary African Studies*, 29(4), 455–472. <https://doi.org/10.1080/02589001.2011.603503>
- Callet, F. (1982). Histoire des rois. Traduction du 'Tantaran' Ny Andriana du R. P. Callet (Tome 5). Nice: Institut d'études et de recherches interethniques et interculturelles. https://www.persee.fr/doc/oeide_0000-0002_1978_mon_5_1
- Ciampalini, A., Frodella, W., Margottini, C., & Casagli, N. (2019). Rapid assessment of geohydrological hazards in Antananarivo (Madagascar) historical centre for damage prevention. *Geomatics, Natural Hazards and Risk*, 10(1), 1102-1124. <https://doi.org/10.1080/19475705.2018.1564375>
- Cissé, L. (2012). Patrimoine et Développement local: le rôle des collectivités territoriales dans la gestion du site des falaises de Bandiagara (Mali). *Icomos*, 1(3), 221-229. <http://www.icomos.org/fr/component/content/article/157-articles-en-francais/ressources/publications/477>
- Dessein, J., Soini, K., Fairclough, G. & Horlings, L. (2015). Culture in, for and as Sustainable Development. *European Cooperation in Science and Technology*. <https://jyx.jyu.fi/bitstream/handle/123456789/50452/978-951-39-6177-0.pdf>
- Diemer, A. (2013). L'éducation au développement durable, une affaire de représentation. *Revue Francophone du Développement Durable*, 1, 30-58. <https://shs.hal.science/halshs-00815145>
- Ekoume, A.M. (2021). L'éducation, vecteur de valorisation du patrimoine culturel : proposition d'une mallette pédagogique sur les œuvres de l'artiste togolais Paul Ahyi [Mémoire de Master, Université Senghor]. <https://dicames.online/jspui/handle/20.500.12177/7166>
- Elamé, E. (2022). The postcolonial critique to continuing development education in sub-saharian Africa. *Formazione & Insegnamento*, 20 (2), 36-52. https://doi.org/10.7346/-fei-XX-02-22_03
- Freedman, M., Antil, T. & Gagnon, J.-P. (2011). De la mise en valeur du patrimoine au développement durable. *Téoros. Revue de recherche en tourisme*, 30(2), 124–127. <https://journals.openedition.org/teoros/1947>
- Froger, G. (2006). La mondialisation contre le développement durable? P.I.E-Peter Lang S.A., Éditions Scientifiques Internationales.
- Guevremont, V (2014). Le développement durable au service du patrimoine culturel : à propos de la Convention pour la sauvegarde du patrimoine culturel immatériel. *Ethnologies*, 36 (1-2), 161-177. <https://go.gale.com/ps/i.do?p=AONE&sw=w&issn=14815974&v=2.1&it=r&id=G ALE%7CA500198038&sid=googleScholar&linkaccess=abs>

- Hudson, J. B., Lee, M. K., & Rasoanaivo, P. (2000). Antiviral activities in plants endemic to Madagascar. *Pharmaceutical biology*, 38(1), 36-39. [https://doi.org/10.1076/1388-0209\(200001\)3811-BFT036](https://doi.org/10.1076/1388-0209(200001)3811-BFT036)
- Labadi, S., Giliberto, F., Rosetti, I., Shetabi, L., & Yildirim, E.(2021). Heritage and the sustainable development goals: Policy guidance for heritage and development actors. ICOMOS. https://kar.kent.ac.uk/89231/1/ICOMOS_SDGs_Policy_Guidance_2021.pdf
- Loulanski, T. (2006). Cultural Heritage in Socio-Economic Development: Local and Global Perspectives. *Environments : a journal of interdisciplinary studies*, 34(2), 51-69. https://www.researchgate.net/profile/Tolina-Loulanski/publication/268061718_Cultural_Heritage_in_Socio-Economic_Development_Local_and_Global_Perspectives/links/546085200cf295b56162037d/Cultural-Heritage-in-Socio-Economic-Development-Local-and-Global-Perspectives.pdf
- Miladera, J. C., Razafinandrasantsoa, M.F., Ravoniarivoa, F. F., Ranarijaona, H.L.T., & Rabesa, Z.A. (2020). Contribution à la sauvegarde du patrimoine culturel et des ressources floristiques de madagascar (Contribution to safeguard of the cultural heritage and floristic resources of Madagascar). *Revue des Sciences, de Technologies, et de l'Environnement* (2020), 2, 152-161. http://madarevues.recherches.gov.mg/IMG/pdf/rste_version_final_sous-theme_1_-163-172.pdf
- Nocca, F. (2017). The Role of Cultural Heritage in Sustainable Development : Multidimensional Indicators as Decision-Making Tool. *Sustainability*, 9(10), Article 1882. <https://doi.org/10.3390/su9101882>
- Pawlicezk, M. & Mehta, H. (2008). *Ecotourism in Madagascar : How a Sleeping Beauty is Finally Awakening. Responsible Tourism.* (pp.41-68). Routledge.
- Rabemanantsoa, R. (2007). *Tourisme et préservation des sites culturels à Madagascar* [Thèse de doctorat, Université Senghor]. <https://dicames.online/jspui/bitstream/20.500.12177/3844/1/RintsamahefaRabemanantsoa.pdf>
- Rabetaliana, H., & Schachenmann, P. (2003). Past, Present and Future of Cultural and Sacred Sites in Madagascar. *The Importance of Sacred Natural Sites for Biodiversity Conservation*, 36-46. <https://sacrednaturalsites.org/wp-content/uploads/2011/10/133358e.pdf#page=36>
- Rafolo, A. (2000). Cité royale, bois sacrés et arbres royaux d'Ambohimanga: un exemple de paysage culturel associatif malgache des hautes terres. *The World heritage Convention and Cultural Landscapes in Africa*. 1-70.
- Saretzki, A., & May, C. (2011). Produire un espace sacré: Controverses autour du site de la colline royale d'Ambohimanga à Madagascar. *Mondes du tourisme*, (3), 26-40. <https://doi.org/10.4000/tourisme.508>
- Tombomiadana, S., Randrianantenaina, H., & Raveloson André. (2020). Des richesses naturelles et culturelles à protéger pour un développement durable : cas de la presqu'île de Narinda, Analalava, Madagascar. *Revue des Sciences, de Technologies, et de l'Environnement*, 3. http://madarevues.recherches.gov.mg/IMG/pdf/rste_vol_3-1_vrr_hl-172-179.pdf
- Wang, Q., (2008). On the cultural constitution of collective memory. *Memory*, 16 (3), 305-317. <https://doi.org/10.1080/09658210701801467>